ELEMENTS OF LETTERING

AND

SIGN PAINTING

PREPARED FOR STUDENTS OF

THE INTERNATIONAL CORRESPONDENCE SCHOOLS

SCRANTON, PA.

A TREATISE ON THE HISTORY, CLASSIFICATION, AND PRACTICAL APPLICATION OF THE VARIOUS STYLES OF LETTERS OF THE ALPHABET

. . . ALSO . . .

THE LATEST IMPROVED METHODS AND PROCESSES USED IN SIGN PAINTING, AND THE HANDLING OF COLORS, BRUSHES, AND TOOLS

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PREFACE.

THE bound volumes of our Courses in Lettering have been prepared on somewhat different lines from those of our other Courses. Believing that the plates would be of more value to the student if he could handle each one separately than if they were bound together in one large volume, we have printed them in folio form, with a plate on one leaf and the instructions for drawing it on the other. All the plates belonging to each Course have been placed in a handsome and durable portfolio, which is sent to the student instead of a bound volume. The students in those Courses that give instruction in Sign Painting receive, in addition to the plates, two Instruction Papers, with their accompanying Question Papers, entitled "Elements of Lettering" and "Lettering and Sign Painting."

The first, "Elements of Lettering," contains the instruction necessary to enable the student to properly apply his knowledge of letters and their formation to suit every requirement, both in treatment and modification, and also in their various arrangement in all forms of inscription and combination designs. This Paper gives a complete education in the art of lettering in all its branches wherein a knowledge of colors is not necessary. The second Paper, "Lettering and Sign Painting," gives the student a complete knowledge of all tools, appliances, and materials used by the advanced sign painter. It includes also instruction in the use of the brush for all purposes, and the preparation, combination, and practical application of colors to all materials. It contains all the methods, processes, and formulas for producing letters on such surfaces as metal and glass by the use of acids, and also instruction for the preparation of all surfaces on which lettering is to be placed. The present volume contains these Instruction Papers.

These Courses in Lettering have been prepared by a gentleman who has had a very wide experience in studying the origin of

letter formation and in teaching the art of lettering, and one who is a thorough master of the subject in all its branches. Great care has been exercised in the selection of the plates containing the various styles of the alphabet. We feel confident that nothing equal to these plates has ever before been published. The utmost pains have been taken to give the student the true form of the various styles of letters shown on the plates. The Courses have been carefully arranged to meet the requirements of every one engaged in any business whatever that demands a knowledge of letters and their construction. Only such instruction and plates are given as have a direct connection with the particular Course selected by the student.

THE INTERNATIONAL CORRESPONDENCE SCHOOLS.

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ELEMENTS OF LETTERING.

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Elements of Lettering.

INTRODUCTION.

1. Purpose of This Course.—It is the purpose of this course of instruction to combine the classical with the practical so as to meet the needs of all students desirous of studying the esthetic and antique, as well as the plain and simple, styles of lettering. The plates are therefore arranged and classified on a simple but progressive system, calculated to lead the student gradually from the plain and simple to the most difficult styles, but omitting from the course all such as are obsolete or not in common use.

Before requiring the student to apply himself to a knowledge of the present forms and classifications of the letters of our alphabet, he should become familiar with their history and the primitive forms of writing. He should also note the important national changes that have caused a transition from one form into another, until our present advanced era has been reached with its great variety of styles, distinctively different in character one from another, and each arising from some important period in the world's history in which the fundamental or parent style was closely allied to a corresponding style of architecture.

In order that the student may derive the greatest benefit from this course in lettering, he should not rest content with merely reading this Instruction Paper carefully once or twice, but should study its contents carefully throughout his entire course. It is only by practice and steady progress in acquiring a knowledge of the styles and formation of letters that the real value and importance of much of the instruction given in this Paper can be rightly understood and its full meaning appreciated.

HISTORY OF THE ALPHABET.

2. Classification.—The wonderful achievements in the arts of printing, photo-engraving, lithography, etc. have been the means of transforming the letters of the alphabet into a variety of forms or styles, which may be classified under three general heads: Plain, Ornamental, and Grotesque. The history of our alphabet and of the forms known as the *fundamental* styles will be found not only of interest but also of great profit to one who is to devote himself to the art of lettering. The degree of perfection attained in the alphabet, not only in phonetic value, but also in simplicity and completeness, makes it a monument of the intellectual advancement of the present day—a condition to which the people of all ages have contributed—although the reader may never have considered its source nor the many changes necessary to its growth and perfection. The twenty-six signs, or letters, that we call the *alphabet* are separated into two classes: those representing no syllabic sounds in themselves, which are called *consonants;* and those possessing two or more such sounds, called *vowels.* The latter in some cases are scarcely more than a breath sound, but each has a clear phonetic value, and fills an important place in our written language. By means of other characters placed above the vowels, every word may be written to express its proper sounds. We are, therefore, enjoying today the fruits of the achievements of the human intellect through forty centuries of development; for, in tracing the origin of the alphabet and the signs that led to its construction, we are compelled to go back to the dispersion of the human race through a period of over four thousand years, each epoch of which furnishes interesting developments in the growth of our letters. It will be impossible in this short treatise to fully consider this interesting history and growth, or give more than a passing glance at the world's primitive history; although in it is to be found the source of the forms whose transitions from one system of characters to another give us our present alphabet. Nor can we dwell even on the relation these characters bear to one another. The degree of intelligence attained in each period of human

history is marked by the progress made in the methods of writing, which enabled its people to record events, impart knowledge, and transmit messages to one another.

3. Ideograms.—The Scriptures inform us that when Babylon and Nineveh were built all people were of one language, and the similarity of the Babylonian, Egyptian, and Assyrian sign languages gives some evidence of this fact. The descendants of Noah are supposed to have occupied these localities after the dispersion: Shem, that of Babylon and Eastward; Ham, Northeastern Africa; and Japheth, Western Assyria and Asia Minor.

Each system of writing began with rude pictures of objects, more or less conventional, which gradually became the representatives of words, afterwards becoming the symbols of letters, or elementary sounds. We can, therefore, trace the transition from the *ideogram*, or expression of thoughts by means of pictures, to the *phonogram*, or expression of sounds by means of drawn or written symbols. Many ideograms are in common use at the present day, which proves that the Egyptian method was not without some merit. For instance, the sign $ is derived from the monogram U. S. The barber's pole—the red stripe of which symbolizes a "blood-letter" (a custom of past ages)—the three balls used by the pawnbroker, the American flag, the sign per cent. (%), the algebraic signs, and many others are all ideograms.

4. Cuneiform Writing.—The letters of our alphabet are the outgrowth of the ancient Hebrew alphabet and Egyptian hieroglyphics (the earliest form of writing), as well as of the Assyrian cuneiform characters. In tracing to its origin the form of each letter, we are surprised at the marvelous transformations these characters have undergone before reaching the simplicity that marks their present construction. While alphabetic systems have become simplified, the Chinese system, on the other hand, which is not alphabetic, has grown more and more complicated, and affords an example of how a people, isolated for four thousand years from the rest of the world, were unable to advance beyond the ancient system of ideographic writing. The Chinese system is evidently the outgrowth

of the cuneiform characters, which are wedge-shaped, and are arranged in groups to express a thought. The simplicity of our alphabet system compared with the Chinese may be appreciated when we consider that a boy ten years old, in an American school, has acquired the same facility in reading and writing English that would take a Chinese student twenty-five years to accomplish in the study of Chinese characters.

5. The Arabic and Roman Numerals.—Without a general knowledge of ancient history it is impossible to form a clear outline of the history of writing, as one is inseparable from the other. From the confusion of tongues to the exodus of the Israelites from Egypt, a period of several centuries, we know that the three continents of Europe, Asia, and Africa were largely peopled; and, though Chinese legends point to periods much earlier than this, the system by which they have come to us, being based on object pictures, produces no evidence as to their reliability. The Hebrew writing, supposed by some authorities to be the outgrowth of the so-called Semitic writing, does not owe its origin to this early period; for there is sufficient evidence to show that the Hebrew alphabet did not come into existence until later. In the middle of this Semitic period, however, occurs the birth of Ishmael, from whom the Arabian race is descended, and to this race we are indebted for our present numeral characters 1, 2, 3, etc. The system known as the *Roman* was in use much earlier, and probably originated in ideographic writing. The digits I, II, III, IIII were originally pictures of the fingers; the V was shown by the whole hand, the fingers collected and the thumb spread apart. The X was expressed by both hands together, each being in the position used to indicate the V. The increase or decrease of value was indicated by placing a digit before or after the V or X. This system is still in use for certain purposes, one of which is the numbering of the hours on the clock dial.

6. The Hebrew Alphabet.—The progress and development of all systems of writing are marked by national changes, and, therefore, when entering on a second historical period of about a thousand years, beginning with the exodus from Egypt

and reaching to the captivity of Israel and Judah, we find a nation of at least 4,000,000 people leaving Egypt and afterward forming a most important element of the divisions of nations and one strongly influencing the many systems of writing. To this great people, it is believed, was given an alphabet, and a language in laws and commandments, embodying civil as well as ecclesiastical polity. The purity of this alphabet has remained to the present time, surviving thirty centuries, the only changes being the present Hebrew characters, which assume more of the square construction than the originals. From this nation also springs another system or alphabet—that of the Samaritans—but before considering this let us turn our attention to another country and people, the Phenicians. The Israelites occupying Palestine were neighbors of this aggressive and thrifty people, and were brought into harmonious relations with them. The chief cities of Phenicia, Tyre and Sidon, were, during the reign of Solomon, maritime centers of great activity. It is assumed, therefore, that the Greek alphabet came directly from the Hebrew and Phenician, while the Phenician in turn was evolved from the Assyrian, Egyptian, and Moabitish.

7. The Samaritan Alphabet.—We find that the Samaritan alphabet has Hebrew as a base, with a strong interspersion of Assyrian and Chaldaic. Israel, about the middle of this period, was divided into two kingdoms, the two tribes constituting the kingdom of Judah and the ten tribes that of Israel. The latter, as well as the Egyptians and Phenicians, suffered severely from the Assyrian and Babylonian invasions. These powerful eastern empires took captive the ten tribes of Israel, thereby causing their complete downfall and loss of national identity. The Mosaic laws prescribed that the soul that did not observe certain ceremonies after eight days would be cut off from Israel; the ten tribes failed to observe these ceremonies as a nation, and therefore lost their indentity in the Hebrew family. They returned to Samaria subsequently, however, and held to a revised Pentateuch—hence the lost ten tribes of Israel and their relation to the Jews. Mention is made of this to assist the student in locating the origin of the Samaritan

alphabet, which is so made up of others that little or no reference is usually made in regard to its origin, bearing as it does so close a resemblance to the primitive Hebrew. The only examples of the earliest alphabets are to be found on monuments or tabulated inscriptions, on coins, and on fragments of utensils. Among these the principal ones during this period are the Baal-Lebanon Bowl, 10th century B. C.; the

FIG. 1.

Moabite Stone, 9th century B. C.; and the Siloam Inscription, 7th century B. C. This period closes with the captivity of the remaining two tribes in Babylon 588 B. C.

8. The Phenician Alphabet.—The Phenician, as previously stated, is the source of our phonetic alphabet; and the ascendency and decline of the Grecian empire and the establishment of the Roman marks another period, during which the alphabet characters attained their present development, as shown by the inscription on the Arch of Titus, built 70 A. D., a cut of which is shown in Fig. 1. In recapitulating what has

thus far been stated, we have satisfactory proof that our phonetic alphabet came from the Hebrew, but descended through the Phenician branch.

9. The alphabet characters have slowly evolved from hieroglyphic writings, first from syllabic signs, and these forms must have been developed from verbal phonograms. The verbal phonograms were adopted from ideograms, which could have originated only from picture writing. Surrounded by such advantages as the Hebrew and the Egyptian characters, and all other forms of writing, it is not surprising that the Phenicians should have constructed an alphabet of clear phonetic value, which afterward gave birth to the classic Greek. The name of every letter of the Hebrew has a significant meaning, while the Greek names, though similar, are meaningless. For instance, the first four letters of the Hebrew and Greek alphabet are as follows :

HEBREW.	GREEK.
Aleph (ox)	*Alpha*
Beth (house)	*Beta*
Gimel (camel)	*Gamma*
Daleth (door)	*Delta*

10. The Greek Alphabet.—Several centuries of the Hebrew period elapse before the Greek alphabet becomes an important factor in the formation of our alphabet, in fact not until after the fall of Greece as a universal empire. But as early as 880 B. C. there came with the birth of the Greek alphabet a most intellectual conception of literature, art, and architecture, of which subsequently the Latins were only imitators.

11. The Latin Alphabet.—Although the Greek alphabet still remains, evolution continues as long as the imperfect exists, and with the fourth universal empire comes the Latin alphabet. As the Roman empire was composed of almost the entire civilized world, their alphabet formed the base, or was the mother of all modern styles of writing. The Roman alphabet

characters of the first century are practically the same as the ones in use today known by the name of Egyptian, Antique Egyptian, and French Roman.

12. The Renaissance.—From the beginning of the Christian era there seems to have been no apparent growth of the alphabet for many centuries. The dark ages were evidently a germinating or budding period, and until the 15th century brings us to an era historically known as the Renaissance, or revival of art, we find no progress whatever. About the middle of this century (1443) printing was invented, but it was many years before this important discovery accomplished much to benefit mankind; for it must be remembered there was no cheap material on which to print, the parchment used to engross on being far too expensive for the purposes of printing. The process of printing had a very beneficial influence on the methods of writing, however, and incidentally on the alphabet itself. The letters had become so elaborate by this time as to appear almost like ornamental enigmas. The process of printing necessarily required for the separate types the simplest forms of characters, and the printers were compelled, therefore, to return to the forms used during the first century; the Latin and Western Roman styles were therefore used, the former being known at the present day as Antique Egyptian and the latter as French Roman.

13. It should be borne in mind that ornamentation in lettering such as marked the period just prior to the 15th century is not an improvement in style. The first principles to be observed in forming letters is simplicity, as the most important qualifications of the letters should be their legibility. Ornamentation when resorted to is always an evidence of failure to produce the perfect letter, for if the perfect is attained the additional work is superfluous.

14. Results of the Renaissance.—The Germans during the 15th century, then located in Northern Italy, were not slow to become imbued with the spirit of this new development in art, and Spain, France, England, and in fact all Europe was

affected by the great impulse, largely on account of the achievements of an Italian family known as the Medici. Previous to this, the art of lettering was confined almost exclusively within the monasteries. The ecclesiastical devotees or monks were skilful in the art of calligraphy, and exhibited wonderful dexterity in their work of designing and illuminating capital letters on their manuscripts, many of which are extant today; some dating back as far as the 5th or the 6th century are especially clever. It is to be regretted, however, that these early monks possessed a knowledge of chemicals for removing the inscriptions from earlier manuscripts from which they copied, thereby depriving the world of records far more valuable than their own. During this whole period prior to printing there were many varieties or styles of the alphabet originated. The style known at present as the Egyptian was originally known as the plain Roman, or the style in which the early Greek and Latin alphabets were written; while the Roman letter of the present day is almost identical with the Medieval Roman of the period indicated by its name. The Gothic, the earliest specimen of which dates to 1349 A. D., was possibly the next style and derived its origin from the ogival or pointed arch, characteristic of the Gothic style of architecture.

15. The Old English, 1400 A. D. (specimens of which are still in Westminster Abbey), was possibly the outgrowth of the 8th century Romanesque, the Old German letters following closely on the Old English. There are many of the German and Italian Renaissance styles that still remain. The Script writing (the ordinary cursive kind), out of which has developed the most graceful and classic curves possible to produce, was of Anglo-Saxon origin. The style known as French Roman, having the horizontal strokes considerably narrower than the vertical, the extremities of these being finished with an antique spur, were of first-century origin, and were used by the Western Roman provinces. The Italic script is a modern interpretation of the Medieval Italian print. There are several forms of the Church Texts, which originated from the Old German as well as the Old English.

16. Modern Styles.—Of the styles of more recent date, the style known as Rund-Schrift (round-writing), which is an adaptation of the German Renaissance, was the invention of a German. Aside from this we name with much pride several styles known the world over as American writing; these are the Full Block, Half Block, both plain and antique, Railroad Block, Round Full Block, Spencerian Script, and Shippers' Box Marking. These styles are used chiefly by letterers, while the varieties in type which are of purely American origin are so numerous that we would not attempt to classify or name them. Their form and style are peculiarly identified with printing, and are seldom if ever used by letterers; while to the art of printing under its many heads is due all progress made in the invention of styles of writing since the 15th century.

GENERAL RULES.

17. The few general rules following are very important to the student, and it is necessary, therefore, that they should be carefully observed and followed.

1. Do not attempt any form or style of letter other than the style furnished for each lesson.

2. Do not allow the eye to dwell on that which is inartistic; for, just as truly as "evil associations corrupt good manners," just so surely does association of the eye with that which is out of proportion, distorted, or irregular, leave an impression which is lasting in its effect on, and by no means easy to dispel from, the mind. When the student has advanced to the study of inscription designing and ornamentation, he will better appreciate the importance of this advice.

3. Do not become discouraged if you do not make as rapid progress as you should like to. The assertion is often made that "it is not possible for one to become a master of an art or profession, without a natural talent for it"; this may be true along some lines, but it is not true in regard to lettering, especially if behind the effort there is persistent will power and a patient determination to succeed. Concentration of thought and constant practice must of necessity follow these qualities.

4. Give as much time to practice as possible; do not be satisfied to make a letter several times only, but practice each letter until you have mastered it, and have learned perfectly all the rules governing its construction in every characteristic line and stroke.

5. Be sure you thoroughly understand all of the instruction pertaining to each plate before beginning to practice. Study the instructions carefully with the plate before you.

Strive to excel; despise mediocrity.

The advantages offered in this course should induce every student to aim above a general knowledge of letters only, and to seek to attain a position equal to that occupied by the few that fully understand the many forms of alphabetic characters and all their applications.

18. Materials Required.—When practicing in the evening, use a good steady light, and place this directly in the rear of the table on which you are working, and from 12 to 18 inches above the work, while the eyes should always be protected from it by means of an eye shade. The student will need the following materials:

Drawing instruments
Drawing board, 16 in. × 21 in.
T square, 22½ inches
2 triangles, 45° and 60°
1 scale
½ doz. thumbtacks
Drawing pencil
1¾ oz. bottle waterproof drawing ink
1 velvet rubber; 1 Faber's improved ink eraser
½ doz. sheets Whatman's drawing paper, 12 in. × 19 in.; ½ royal size
2 red sable brushes, Nos. 3 and 4
1 pad ruled paper, 2 in. × 7 in.

19. Draftsmen and other students interested in a similar class of work will find these tools sufficient for practice and specimen work. But for the benefit of the students that wish to apply a knowledge of lettering to sign painting we would advise that the practice work be done on cardboard or Manila pattern paper, using a camel's-hair brush, and card black, the preparation of which will be given hereafter. By this process the letters can be made any size, but the plate sent in for correction must invariably be 8¼ in. × 15 in., inside the border lines, which are 1⅝ inches from the edge of the paper.

DRAWING THE LETTERS.

MECHANICAL AND FREEHAND LETTERING.

20. Instrumental and Freehand Drawing Definitions.—Drawing is the art of representing objects on a convenient surface, such as paper, by means of lines or colors, or both. The representation of an object in this manner is called a *drawing*. If the pencil, brush, pen, or marker by which a drawing is made, is guided wholly or partly by instruments, as, for example, by a straightedge or by compasses, the drawing is called an *instrumental* or *mechanical* drawing. If no instruments are used, the lines drawn by the free hand, and all dimensions laid off by eye only, the drawing is called a *freehand* drawing. A preliminary rough or unfinished drawing is usually called a *sketch*.

21. Purpose of a Drawing.—The purpose of a drawing is either to assist the memory or to convey to others an idea of the shape, size, combination, form, color, or appearance of some object. Drawings also aid us in perfecting ideas when we are designing or inventing. The practice of freehand drawing trains both the hand and the eye. It enables one to estimate distances and lay them off on a drawing correctly, and to compare the relative sizes of angles, lines, and figures in general. It thus trains the hand to draw quicker and better with instruments. The ability to draw well freehand is one of the most useful of accomplishments.

22. There are but two plates or styles in this course that are in the true sense mechanical styles, that is, made exclusively with the aid of a straightedge and other instruments. These are the Full-Block Plate and the Half-Block Plate. The others are made up of straight lines and curves. These curves, though slight in many cases, are all drawn by the free use of the hand, and therefore, so long as freehand drawing enters into their construction, we have chosen to classify them under this head. We advise the use of the straightedge, however, in

making all straight lines, whether in mechanical or freehand styles, but do not recommend the use of the compasses in making curves in freehand letter styles, unless a perfect circle is required.

COMPONENT PARTS OF A LETTER.

23. Stroke.—The stroke is the term applied to the width between the outlines forming the letter; when applied to letters possessing more than one width between its outlines, it always refers to the greatest width, and usually the vertical portion of the letter, as distinguished from the "fine line."

24. Fine Line.—The fine line is the line connecting the strokes or lines attached to them, forming a part of the letter, and is usually a horizontal line.

25. Spur.—The spur is a small projection from the extremity of a letter, and exists in several varieties, according to the style of letter on which it is used.

26. Face.—The face of a letter usually includes all the space forming a rectangle enclosing the extremities of the letter, but is often applied to the surface within the outline of the letter.

27. Shade.—This term is used to describe the treatment or finish of a letter, and is applied to a letter to give it the appearance of relief from the background; also to cause one part of the stroke to appear projected or depressed from the surface.

28. Block.—This is similar to the shade in effect, and is used to give a letter thickness, or, as its name expresses, to give it a solid block effect, in which case the shade also is sometimes used beyond the block in the form of a natural shadow.

29. Outline.—The outline of a letter is the line that forms the letter, leaving the body of the stroke open.

30. Width.—The width of letters always applies to the space occupied between the vertical lines to the extreme right and left, and never refers to the height.

31. Background.—The background is the surface on which the lettering is placed; it is also sometimes called the *ground*, or *field*.

32. Condensing.—Condensing is a term applied to the closer spacing of the letters, or to making them narrower than normal width.

33. Elongating.—Elongating is the term applied when the letters are drawn out to a greater width than the normal. This term should not be confused with the appearance of a condensed letter, with the relation of its height to its width.

34. Cyma.—The cyma is a character employed to equalize the spacing of irregular letters by placing it where the space is open and requires something more than the plain letter to make the word appear solid. This character derives its name from the Greek, its undulating form resembling a wave. The cyma is usually attached to the letters A, L, M, W, etc.; it is used in but few styles of lettering, while in some styles it forms a part of the letter itself.

SPACING OF LETTERS.

35. Importance of Spacing.—Next in importance to the formation of letters stands the art of arranging them in words in a way calculated to make the word not only legible but symmetrical; this is called *spacing*. Nothing will destroy the harmony of a line of perfectly formed letters more effectively than a disregard of this art. Aside from a few general rules, the letterer must depend on his own good judgment, and cultivate the ability to proportion all spaces according to the combinations of letters. Irregular combinations occur in many ways, but true proportion must always reign in a word accurately spaced, so that its regularity is apparent to the eye at a glance. To accomplish this, special attention must be given to the following rules:

36. Correct and Incorrect Spacing.—Make the interspacings equal to one another, or as nearly so as possible. To do this may require the shortening of some extended letters, and the spreading apart of letters having vertical or parallel

lines. This is shown by Figs. 2 and 3, in which the right and the wrong spacing can be seen. The L in Fig. 2 is shortened a full stroke in width instead of one-half stroke, which is the normal width of the letter; and the space between the A and the W is about one-half the width of the letter A at its base. At the top of the A is shown the *cyma* used to relieve the space which cannot be equalized. The cyma is also often used in a

Fig. 2.

Fig. 3.

vertical position on the L, the point almost resting on the lower right-hand spur. Fig. 3 shows the effect of the rule followed by some letterers, who allow the same space between the extremities of all letters, and make no allowance for unequal-sized interspaces. The parallel strokes of the A and the W are the same distance apart as the L and the A, leaving the L full width. Many such combinations occur, and unless we observe this rule we may expect no better effects than in Fig. 3. Two projecting letters, either L's or T's, often occur together, as in such words as "millinery," "butter," etc., and at the same time in connection with letters that are full face or occupying full width top and bottom, as shown in Fig. 4. In such cases the L should be made the width of the stroke

Fig. 4.

Fig 5.

narrower than the full-face letters, and the spaces between the latter and the right-hand letters next to them should be one-half the width of the stroke. There should be a space of the full width of the stroke between parallel-stroke letters, as the I and the L. In Fig. 5 the T's are shortened only one-half the width of the stroke, allowing the same space between them and the letters on each side as allowed in Fig. 4 between the end of

the right L and the stroke of the N. The letters, therefore, with which we shall experience the most difficulty in spacing, are the slanting-stroke letters A, K, V, W, and Y and the projecting letters F, J, L, and T.

37. Full Block and Roman.—When spacing such styles as the Full Block and Roman observe the following rules: When two letters having spurs come together, as

leave the width of the stroke of the letter between the spurs. When a spur and a plain-stroke letter come together, as

leave $1\frac{1}{2}$ width of stroke between body or stroke of letters. When two spurless letters, as

come together, leave space of one stroke between them. Slanting-stroke letters, such as the W and the Y, leave the half-stroke space between the spurs, and the same space if the next letter be a spurless letter.

38. Egyptian, Half Block, and French Roman.—The Egyptian, Half Block, and French Roman can be spaced by the following rules: Leave width of stroke between all parallel-stroke letters, and one-half this width between projecting letters. Between round letters coming together on rounded sides, as

leave $\frac{1}{2}$ stroke. Between words never allow less than the space

of a full-sized letter, including spurs; and, if possible, leave $1\frac{1}{2}$ spaces. Never allow letters to touch each other, except shaded letters, and not then unless it is unavoidable. Two round letters coming together, such as

OO

in condensed styles, having no spurs, may be allowed to almost touch each other without having the effect of doing so; while such letters as

JE

produce the effect of being closer together than they really are.

39. Care must always be exercised in selecting a style of letter to suit a space as well as a word. The placing of a word in a given space not appropriate to it will cause the letters to be either so separated by spaces or so condensed for want of space as to make them unsightly and difficult to read. Under the heading of "Inscription Designing," the subject of the

SENATE

FIG. 6.

selection of styles to meet all requirement is fully treated. The appearance of the spacing of letters is similar to that of a company of soldiers. If a portion of the company be separated by a space greater than the manual prescribes, it has the appearance of a separate detachment and is noticeable at a glance. In the same manner, if a word is spaced properly throughout with but one exception, it has the appearance of two words. For example, take the word *Senate* shown in Fig. 6, where the space between the N and the A gives it the effect of two words.

PUNCTUATION.

40. There is seldom sufficient attention paid to this important subject among letterers, as may be observed on the signs on almost any public street.

41. Origin of the Apostrophe.—The apostrophe is frequently misplaced in the plural possessive case. To fully understand the rule governing the possessive case and the origin of the mark used to denote possession, we should first know that the apostrophe is used to indicate that something has been omitted. If we should look on the fly leaf of some very old book, we would see the name of the owner, "John Smith," and underneath, the words "his book," which was the early form of expressing the possessive. Later, it became a custom to contract the name and article possessed—thus, "John Smith's book"—and to insert the apostrophe to indicate that the "his" was omitted. By bearing in mind this simple custom, one can always locate the proper place for the apostrophe, according to the location of the pronoun. To further illustrate, take, for example, the words "men's and boys' clothing." To use the method of our ancestors we would express it, "men, their clothing, and boys, their clothing." According to the rule, the apostrophe and final "s" should be substituted for the pronoun, making the phrase read "men's and boys' clothing." Thus, the letter "s" would not be necessary after the apostrophe in the word "men's," as the pronoun "their," which has no final "s," is used; but for euphony, or to obviate harshness of sound, the "s" is often added after many words, and also omitted from words ending with "s" for the same reason.

42. The Comma.—The comma is frequently used where the period is the mark required. For instance, the words "John Smith. Law Office." make two complete and independent statements, and each should be terminated by a period. However, if the words used were "John Smith, Lawyer." the case would have been different, as there is but one statement, which should be terminated by the period.

RULES FOR PUNCTUATION.

43. Period.—The period is put at the end of every word, phrase, or sentence that is complete by itself, and not interrogative or exclamatory. It is also placed after all abbreviations.

Quit yourselves like men. The M. D. addressed his letter to James Howard, LL. D.

44. Colon.—The colon is an intermediate point between the semicolon and the period, and is used as follows :

1. After words that promise a series or statement of something important.

His accomplishments, he said, were not many : a stout heart, a firm resolve, and—fifty cents.

2. Before an important remark added to a sentence, especially when it sums up the sentence, or presents the meaning in another form.

Avoid evil doers : in such society an honest man may become ashamed of himself.

45. The Semicolon.—The semicolon is used to separate clauses that are themselves divided by the comma, or that require a point greater than a comma and less than a colon ; or to separate the parts of a loose series.

He was courteous, not cringing, to superiors ; affable, not familiar, to equals ; and kind, but not condescending or supercilious, to inferiors.

46. Comma.—The comma is the most frequently used of all the punctuation marks. The chief purposes for which it is used are the following :

1. To separate the terms of a closely related series, or two such terms when the connective is omitted.

Hedges, groves, gardens.
It was a dark, desolate region.

2. To separate terms that are contrasted or otherwise distinguished, and terms of which a part in one might be referred improperly to the other.

He is poor, but honest.

3. To set off a word, phrase, or clause that is parenthetic, or that comes between other parts and breaks their connection.

You will then, however, be in no better condition.

4. To set off a modifying word, phrase, or clause that is not closely connected with what it modifies, or that is removed from it by inversion.

Behold the emblem of thy state in flowers, which bloom and die. By Americans generally, the hero of the Battle of Manila Bay is beloved.

5. To set off words or phrases used independently or absolutely.

Ristalfo, give me what is mine, and that right quickly.

6. To separate the predicate from its subject, when the subject is very long, and has a clause, or consists of punctuated parts.

The fact that he is allowed to go unpunished, makes him more insolent than ever.

7. To separate clauses that are neither very closely nor very loosely connected.

There mountains rise, and circling rivers flow.

8. Short simple sentences or clauses seldom require a point within them ; and phrases or clauses that stand in close connection with that on which they depend seldom require a point before them.

Tell me when it was that you saw him after he returned.

47. Interrogation Point.—The interrogation point is placed after every complete direct question, whether it forms a complete sentence or only a part of a sentence.

What mean'st thou by that? Mend me, thou saucy fellow?

—*Julius Cæsar.*

48. Exclamation Point.—The exclamation point is placed after a word, phrase, clause, or sentence that indicates great surprise, grief, joy, or other emotion in the speaker.

Woe unto thee, Chorazin! Woe unto thee, Bethsaida!

49. Dash.—The dash is chiefly used for the following purposes :

1. To show omission caused by interruption.

Cassius. Yet I fear him:
For in the ingrafted love he bears to
Cæsar—
Brutus. Alas! good Cassius, do not think of him.

2. To show emphasis or suppressed feeling, or to show an unexpected turn in thought or style.

Heaven gives to its favorites—early death.

3. To set off a parenthetical phrase, especially when emphatic or when there are other points within it.

To render the Constitution perpetual—which God grant it may be—it is necessary that its benefits should be practically felt by all parts of the country.—*D. Webster.*

4. Before echoes, or where the words "that is" or "namely" are understood.

The four greatest names in English poetry are almost the first we come to—Chaucer, Spencer, Shakespeare, and Milton.

50. Parenthesis.—The parenthesis is used to enclose some incidental remark or explanation that breaks the regular construction of the sentence and can be omitted without injuring the grammatical sense.

Know then this truth (enough for man to know),
Virtue alone is happiness below.—*Pope.*

51. Quotation Marks.—Quotation marks are used to enclose words taken from the saying or writing of another person.

The doctor made the sage remark, "while there's life, there's hope."

52. Apostrophe.—The apostrophe is used to denote the omission of one or more letters.

'Tis pleasant, sure, to see one's name in print;
A book's a book, although there's nothing in 't.
—*Chatterton.*

53. Hyphen.—The hyphen (-) is used (1) at the close of a syllable that ends a line when the remaining part of the word must be carried to the next line; (2) to join the parts of compound words.

54. Ditto Marks.—The ditto marks ('') are used to avoid the repetition of the word or expression directly above them.

55. Underscore.—The underscore is a line drawn under words in manuscript or copy to give them special emphasis, showing that they are to be printed in Italic or capitals, one line denoting Italic, two lines denoting small capitals, and three lines large capitals.

SHADING.

56. Shading on the Left Side.—Shading is used to cause the letter to appear in relief, and thereby take away the flat or plain appearance. Shading may be placed on the top, bottom, or either side of a letter, but it should at first always be placed on the bottom and left side; as, for several reasons, it is best not to try to shade a letter on the right side until the student is familiar with the left, as he will use this side for all practical purposes. The reasons for giving this side the preference are: (1) Regularity and symmetry of the shade occurs

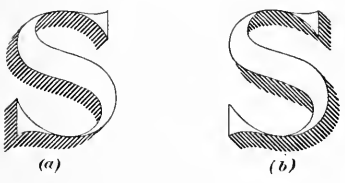


FIG. 7.

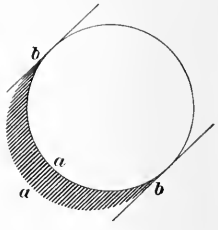


FIG. 8.

in more of the letters when shaded on the left side, such as the S, E, C, R, etc. Fig. 7 illustrates this advantage, and shows the single stroke on the left at (*a*), and the broken shade from the stroke on the right side at (*b*). (2) By shading to the left, the letterer can accomplish more in a given length of time, and produce a better effect in his work when finished. (3) The majority of strokes in shading to the left are drawn towards the letterer, while in shading on the right the brush is pushed to the right, which in itself is a strong argument in favor of the former.

57. Shading should always be executed on the assumption that the light falls on the letter at an angle of 45°. This principle can best be shown by reference to Fig. 8. The maximum width of the shade occurs at *a*, *a*, midway between the two lines *b*, *b*, and then diminishes to lines *b*, *b*, where it is completed. The tendency of the average letterer is to give too much thickness where shade begins or finishes. All letters must be shaded on the same angle at every point, and, after practice, this angle becomes as well established with the letterer as the horizontal or vertical lines. Every characteristic point of the letter must be shown in the shade, as at *a*, Fig. 9, and all

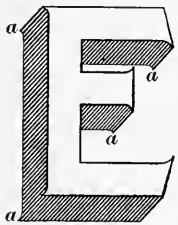


FIG. 9.

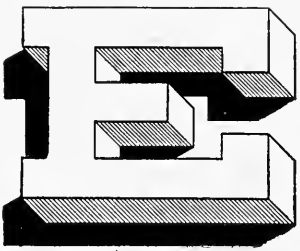


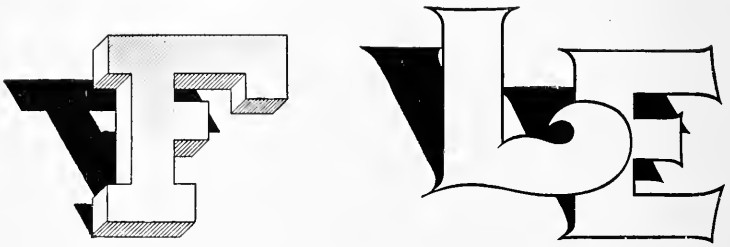
FIG. 10.

must be of equal width in all letters except the round characters, whereon the shade reaches this width only at the maximum point of thickness in the letter.

58. Block Shade.—There are many methods of obtaining beautiful effects in shading, which will be considered separately. The block shade, as its name indicates, consists of the effect of making the letter appear to have thickness. This is done by the use of two shades, the dark, or stronger, one being used underneath all horizontal strokes, and the lighter tint on the side of all vertical strokes. The block shade can be placed on the top or right side of the letter, in which case the block, as well as the letter itself, is shaded as shown in Fig. 10. Here the shade has below and to the left of the letter the appearance of a cast shadow.

59. Cast Shadow.—The cast shadow is also used in connection with heavy-stroke letters, block shading, etc., giving the

letter the appearance of standing upright, either on a level or on a slanting surface. The top of the shade is on a line about one-fifth of the height of the letter below the top. The shade is made on an angle of 30° to the left, the point resting on the



(*a*) (*b*)

FIG. 11.

lower left corner of the letter, as in Fig. 11, where (*a*) shows the letter with a block shade and cast shadow, and (*b*) shows the simple outlined letter and cast shadow. The shade is sometimes used by duplicating the letter in the form of a shadow cast on the background, one-fifth of the height of the letter below the top, and on the same angle (45°) as the regular shade, as shown in Fig. 12.

60. Relief Shade.—Relief shade is obtained by leaving a space between the letter and the shade on the same angle as

FIG. 12. FIG. 13.

the shade, as shown in Fig. 13, making the space and shade of uniform width. When used in connection with block shade, it is often of the nature of the natural shade, and is added to the block shading without any line or space between. The

relief shade when used as a natural shade on a white or tinted ground is made to represent the strength of the shadow cast from an object on the ground on which the letters are placed. This shade is produced with the pen by means of lines, but more effectively by the brush and transparent color.

LETTER-FACE LIGHTING AND SHADING.

61. Importance of Subject.—The treatment of the face of the letter is a very important consideration. The letterer often finds himself confronted with a line of extremely plain lettering that, even after it is shaded, remains flat and unsatisfactory. This effect can sometimes be overcome by the addition of lights and shades placed directly on the letter face itself. The face of the letter may be variegated or blended from a light to a dark shade, in which case a sharp outline must surround the entire letter, as shown in Fig. 14. Lighting and shading

FIG. 14.

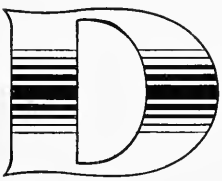


FIG. 15.

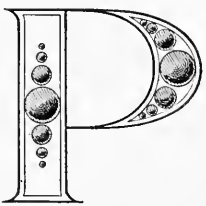


FIG. 16.

are used with best results on heavy-faced letters, as all treatment of the face of a letter by shading has the tendency to considerably reduce the apparent width of the stroke.

62. Effects Produced.—Another effect is produced by running bars of color across the center of the letter, and diminishing these bars in width to a point midway from center to top and bottom, as in Fig. 15. Diminishing circles are also used on letters of lighter face, such as the Roman, and can be made to occupy the entire face, or, as is shown in Fig. 16, terminating at a given point, which must be regularly observed throughout the line of letters.

63. Heavy Highlight.—The heavy highlight is used in the treatment of the face of the letter by making the upper half of the letter a uniform tint, either by lining, as shown in Fig. 17, or with colors. The darker shade *b* is placed on the lower half of the letter, allowing a highlight on this equal in strength to *a*, or the upper half. The highlight *c* on the upper half of the letter is left white. By a combination of the shades of colors many beautiful effects can be produced by this means, using such colors for *a* as blue, green, gray, or gold color, the last of which combines with sienna for the lower portion, and with cream color for the upper highlight. Blue or green when used should have tint and shade of the same color.

64. Beveled Shading.—Shading on the face of a letter to represent a beveled appearance is another treatment that gives a line of lettering a finished and pleasing effect. In this

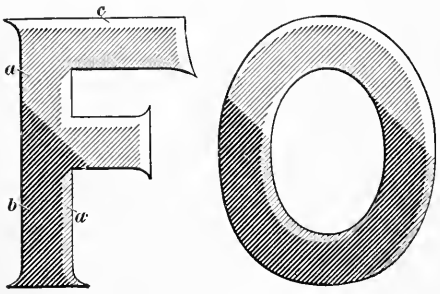


FIG. 17.

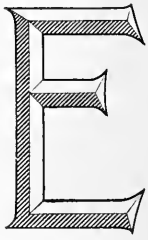


FIG. 18.

process it is necessary only to observe the rules of light and shadow, as shown in Fig. 18, by shading the letter on the left and bottom sides from a line drawn through the center of the face of the letter. This form of shading is often used on a gold or silver letter by the use of transparent colors such as varnish stained with asphaltum, which is used on gold, and varnish darkened with lampblack is used on silver letters. There are many other methods of treating the face of letters by the use of ornament, whereby it loses its identity as a plain and becomes an ornamented letter.

THE HIGHLIGHT.

65. As its name indicates, the highlight is used to illuminate or light up a letter, which it does with wonderful effect. The highlight is placed on the edge of the letter, opposite the shade, or on the right and top of the strokes. It is always a fine line of either gold, silver, white, or cream, according to the color of the letter on which it is to be placed. If the letter is a colored letter, gold or silver can be used. If the letter is gold, nothing will serve the purpose of a highlight so well as cream or white. On silver or aluminum, white only can be used. To be most effectual this highlight must be a fine, even line. The heavy highlight is used in letter-face lighting and shading, and is explained under that head.

CUTTING IN LETTERS.

66. Uses of Cut-In Letters.—This term is applied to that style of treatment wherein the letters are drawn in outline, and the background is filled in around them. In inscription designing this method is resorted to frequently, in order to

FIG. 19.

break the monotony of several lines of plain lettering. The insertion of a panel or ribbon, on which the letters are "cut in," provides a colored background, against which the letters are outlined, allowing the same color for the letters as the main ground of the inscription design, as shown in Fig. 19. The color of the panel and background will govern very largely the character of letter to be cut in. If the general ground is white or any *light* color, and the cutting-in, or outline, color is very dark, a heavy-faced letter may be used without causing any

appearance of clumsiness or ill proportion. But should the letters be in gold, a much lighter-faced letter would be necessary, as the effect of the gold luster is to make the letter appear larger than it actually is. A very fine line of gold on a black ground can be readily distinguished even at a great distance,

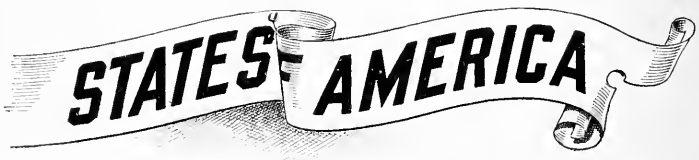


FIG. 20.

and a white letter on a blue ground can be read at a greater distance than any other combination of colors.

67. Points to be Observed.—In the practice of cutting in letters the student should begin on the plainer styles, such as the Full Block, Half Block, etc., before endeavoring to execute the Roman or Script. Fig. 19 shows the letters in outline, and also with the background filled in. In order to insure uniformity of width in the horizontal elements of the letters, faint lines may be drawn through the entire word by means of a thread or string charged with charcoal, chalk, or other material that afterwards may be readily dusted off. Cut-in letters may

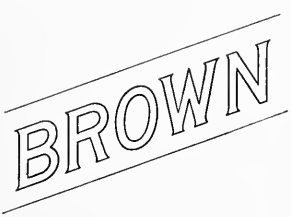


FIG. 21.

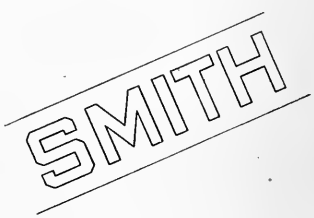


FIG. 22.

usually be permitted to stand closer than other styles of work, as they are seldom shaded, though when they *are* shaded, the regular spacing should be used.

68. Irregular-Surface Lettering.—Where letters are cut in on an irregular surface, such as a ribbon, as in Fig. 20,

they must be maintained at a uniform angle and not changed to suit the angle of the ribbon, as at *a*. The importance of this will be considered more fully later on, but its connection with the subject now under discussion must not be overlooked. When letters are cut in on an inclined panel or ribbon the letters should be maintained in a vertical position, as in Fig. 21, or perpendicular to the lines of the panel, as in Fig. 22.

CLASSIFICATION OF LETTERS.

ORNAMENTAL LETTERS.

69. Scope of the Subject.—The plain letters include all alphabets in which no line or curve enters that is not absolutely necessary to show their form or outline; a line thus added may place them among the ornamental letters. Although it will be impossible to go over the entire ground covered by this subject, as there are endless varieties of ornamental letters, the styles found to be most essential will be considered. There are many letters into which ornamental construction enters but slightly, while others are composed entirely of ornamental forms. The ornamental letters of most value to the student are those on the face of which the ornament appears, either in the form of relief scrolls, geometrical figures, or designs in arabesque.

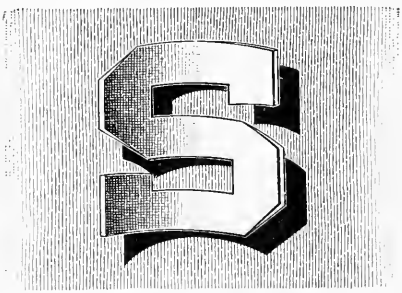


FIG. 23.

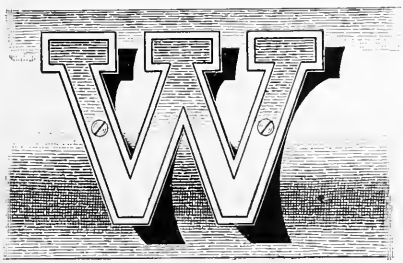


FIG. 24.

70. Ornamental Forms.—Letters classified as ornamental are of so great a variety that such as are used in connection with the shade to produce a bent or rounded effect, as shown in Figs. 23–24, might be classed with this style. Fig. 23 shows the ground to be a plane surface and the letter bent or warped, while Fig. 24 shows the letter to be perfectly straight, and fastened with screws, while the ground has the effect of being bent or warped.

FIG. 25.

71. A letter that in itself is perfectly plain but surrounded by ornamentation, as shown in Fig. 25, is called an ornamental letter also, though as a matter of fact the letter itself may be perfectly plain.

(a) *(b)* *(c)* *(d)*

FIG. 26.

72. Other Forms.—Other ornamental forms are as follows: The relief-ornament letters shown in Fig. 26 can be made in various ways. The whole form of the letter may be treated in this manner, as at (*a*), or by simply suggesting it in the middle or edge of the letter, as in (*b*), (*c*), and (*d*). A letter may be plain, so far as its face is concerned, but on account of its

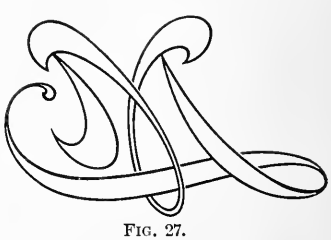
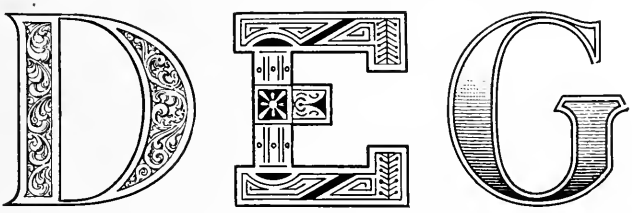


FIG. 27.

form and construction it may be classified as ornamental, as shown in Fig. 27.

There are many forms of designs used in letter-face ornamentation, either filigree work, geometrical designs, or a com-



(a) (b) (c)

Fig. 28.

bination of both. In Fig. 28 are shown three letters of the face-ornament class, the one at (*a*) being decorated with filigree work, while (*b*) shows a geometrical design, and (*c*) simply the cross-line shading.

GROTESQUE LETTERS.

73. All letters, as previously stated (Art. **2**), are either plain, ornamental, or grotesque. The first two classes follow in their outline construction the forms of the fundamental styles and their many variations, but this third class is entirely different. The grotesque letters have no recognized or classical form, such as would place them among the styles of the alphabet, but are made by using natural objects, which are arranged so as to conform to any regular or irregular shape that will cause them to represent a letter, and any form, therefore, is allowable so long as the letter may be recognized. To accomplish this, objects such as a human figure, a piece of rope or ribbon, broken boards, leaves, vines, and trunk of the tree, are used.

Fig. 29.

Of the three latter forms, the rustic letters are made. The leaves, tendrils, stump, and trunk of the tree form the material used for an entire alphabet, one letter of which is shown in Fig. 29. These letters can be made very artistic, and show

great skill in their arrangement. And, while they may be pleasing to the eye, they are of no practical importance to the student in the study of the forms of the letters, as their proportions are purely arbitrary. Fig. 30 shows the forms of

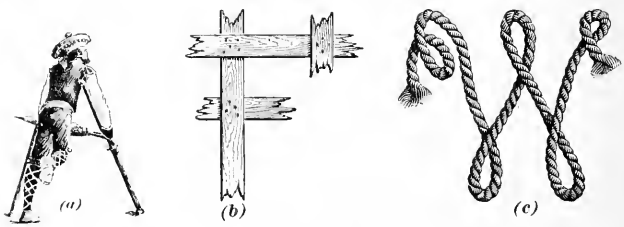


FIG. 30.

some of the grotesque letters, in which (*a*) is formed by a human figure, (*b*) by broken boards, and (*c*) with a piece of rope. Any alphabet may be constructed of these forms as the fancy of any artist may dictate, even though he may be ignorant of the true form or proportion of the simplest style of the alphabet.

ILLUMINATED CAPITALS.

74. History and General Use.—The monks of the Middle Ages were the first to make use of this art, many specimens of which would indicate that they must have spent days in designing and executing a single letter. In treating this subject here, our purpose is simply to call attention to the most simplified forms of illuminating, especially those forms designed for the use of the average letterer. The practical use of this art is now confined to lithographing, engrossing, card work, and ecclesiastical decorations. The printing and lithographing artists have displayed wonderful skill in recent years in illuminated work, especially on show-bill designs. The use of colors to light up the capital letter gives a surprising effect to a complete line of lettering, and is done by a simple combination of designs of most harmonious colors with the letter executed, and by using colors of striking contrast to the tints used to form the background. Such colors as can be combined to give a brilliant effect are used in the form of a plaque,

part panel or both, on which the letter is brought out most conspicuously, as shown in Fig. 31. The illumination practiced by engrossers is usually of such a nature as to produce a finished and pleasing effect without resorting to colors. There are many ways by which this can be accomplished. One method is simply by the use of a pen and black ink, as shown in Fig. 32, outlining the letter first, then making the orna-

Fig. 31.

mentation surrounding it conform to any desired design, thereby giving the letter prominence. Great care should be taken that the ornamentation is not made more pronounced than the letter, but rather that the former is used as a means to bring out or illuminate the letter.

75. Card Work.—For card work, the illuminating of capitals gives tone and finish, and relieves a show card of extreme

plainness. For practical purposes, such as attractive advertising cards, banners, etc., the illuminating of capitals will be found to hold an important place, and is coming into favor and more general use. There are also many forms and designs employed as a panel, on which illuminated capitals are placed, in a solid or outlined letter; the outline letter, however, being the most convenient, is most frequently used, especially when either the panel or the letter, or both, are to be treated in water colors. The letter outlined is sometimes filled in with carmine or other bright color, while the panel surrounds it with a tint of cream-white, yellow, or green. Two or three shades of color are sometimes used, either variegated or in the form of line work on top of tint, as in Fig. 33.

Fig. 32.

76. Ecclesiastical Decorations.—For ecclesiastical decorations, such as wall panels containing inscriptions, which

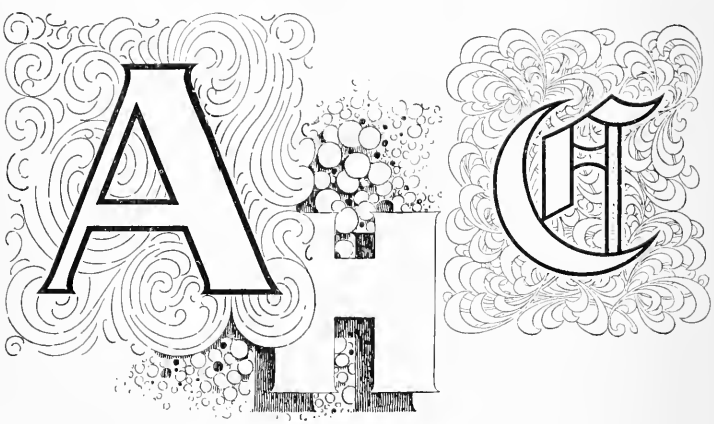


Fig. 33.

are usually in the Old English, Gothic, or Church Text style of letter, as well as for display mottoes in schools, halls, etc., where the Old English or other suitable lettering is used, the first

capital (and sometimes all capitals) is illuminated, either on a panel of gold, silver, or color. In all cases the panel is made

Fig. 34.

to conform in a general way to the letter, as Fig. 34 shows. If gold or silver is used for a ground, the letter must be a dark color. If a colored ground (which is preferable) is used, a gold or silver letter will be found to light up with colors and produce a most satisfactory result.

Fig. 35.

77. Heraldic Shield. An heraldic shield is often brought into use, on which the illuminated capital is placed. There are many designs or forms of this shield, which can be changed to suit any form of a letter, as shown in Fig. 35.

EFFECTS IN LETTERING.

CONDENSING, ELONGATING, TELESCOPING, AND INTERLACING.

78. Condensing Letters.—In conforming letters to fill a required space, we are often compelled to resort to various means of accomplishing our purpose, without making the inscription appear distorted or out of proportion. When the panel or space to be lettered is much shorter than would admit of a regularly proportioned letter, we are compelled to resort to the condensing of the letters, observing generally the

rules of their proportionate width. All styles of letters can be condensed except Railroad Block, which was invented exclusively for the opposite purpose. To illustrate more fully,

FIG. 36.

the word *Company* is used to show the two forms of condensing, as well as the two forms of elongating.

79. Example of Condensed Letter.—In Fig. 36 is shown the condensed form, as may be seen by comparing the proportions of the letters with those of the Half Block Plate. The letterer may condense his letters to the width of those of Fig. 36, and find they are still too large for the required space; the vertical strokes can then be reduced to one-half the regular width, and the horizontal strokes maintained at the regular, or even greater, width, and less space allowed between letters, as in Fig. 37. This reduces the word to almost one-third that of Fig. 36.

FIG. 37.

80. Elongating Letters.—To elongate the same word in the same style of letter, make the height, for convenience, one-half that of Fig. 36; thus it will be observed that if this elongated letter were twice the height it is in Fig. 38, it would

FIG. 38.

occupy a space almost four times that of Fig. 36. To further elongate this word, reverse the rules of Fig. 37, by reducing

the horizontal strokes one-half the regular width, keeping the vertical strokes regular width; or these may be increased to twice their regular width if desired, also giving more space between the letters, as shown in Fig. 39. By this means a word

Fig. 39.

can be made to fill a space much too long for the regular proportion given this style of letter.

81. Telescoping.—Telescoping is not of so much practical advantage as condensing or elongating, and is used mostly to produce a relief effect. This is done by giving the letters the appearance of overlapping one another, as shown in Fig. 40.

Fig. 40.

Every alternate letter is dropped enough below the line to prevent confusion of horizontal lines and to preserve the complete identity of each. These letters can be shaded on the background but not on the face, as this would tend to destroy their legibility.

82. Interlacing.—Interlacing to its fullest extent enters into the construction of a monogram; but the form of interlacing at present under consideration is somewhat different, and includes the interlacing of an entire word. This is very often resorted to by the designer, especially in the use of eccentric letters, which are made to extend far beyond the limits of the fundamental styles from which they are derived, as shown in Fig. 41.

OUTLINING AND FILLING IN.

83. Water Colors.—Water colors are used for all classes of designing, and especially in commercial advertising work, as a small quantity of lithographic or printed work executed in black outline can be very economically colored or filled in with water colors by hand. A knowledge of the handling of water colors is, therefore, a necessity to the letterer. Dry color in powdered form is used when large areas of blended color are required. This is applied with a wad of cotton, with which the

FIG. 41.

dry color is spread evenly over the surface by gentle rubbing. The outline of the design is the guide for all water-color work in lettering panels, floral designs, etc. The wider this outline is made, the easier will be the work of flowing the color evenly, and the less the liability of running over the line; the fine outline, however, is used in many places, especially for floral designs, etc.

84. Use of Water Colors.—Water colors are used to the best advantage on white show cards, having a dull finish, which readily absorb the moisture. The outline is made with the glossy black to which the water color will not adhere, but flows to the edge and stops. By this outline method, beautiful designs in flowers and highly illuminated effects can be produced. Water colors also serve the purpose of shading or

tinting borders of cards outside of the fine line. For shading the letters, a brush is used that will as nearly as possible make the shade with one stroke, as water color cannot be worked over, when once applied, without showing brush marks. Therefore, the color must be flowed on evenly with a quick, well-directed stroke, using care not to apply the brush again over a shaded part when the excess water has been absorbed by the card.

DESIGNING.

85. Scope and Importance.—The subject of designing is an almost inexhaustible one, and covers a broad field. There are, however, many general rules and many commonly accepted forms, which establish a foundation on which new ideas may be built. Designing will ever be an art that, aside from these general rules, involves the faculty for producing original conceptions or combinations which must conform to the dictates or system of a recognized class or school. Very few letterers are designers in the full sense of the word, and few of our best designers are good letterers. Students in this course should cultivate a knowledge of this most important subject. An inscription of several lines of lettering, arranged so as to show intelligence in design, proves that the letterer has accomplished that which is of as much importance as a knowledge of the proper formation of letters. The first thing, therefore, is to study the underlying principles of designing from the curve, which forms the first departure from a plain line of letters, to the combination, pictorial, and the wide field of original designs, the possibilities of which lie beyond the limits of this Instruction Paper. In showing the many ways in which curved lines are used for inscriptions, we will not attempt to make lines of letters, but allow the curves and straight lines to represent these.

86. Some Simple Combinations.—In Fig. 42 is shown the combination of the plain curve and straight line. The Roman letter or some light-stroke style is used on the curved-line, block, or other heavy-stroke letters on the straight line. The letters on the curve must be either vertical or parallel with the radius of the curve.

Next in importance is the compound curve, or ogee, which is used when the inscription is composed of two words of about equal length, as in Fig. 43. Here, two ogee curves are used

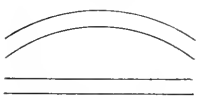


FIG. 42.

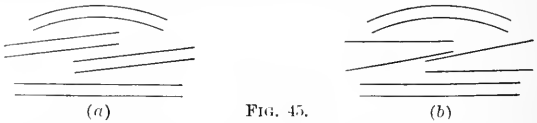
FIG. 43.

FIG. 44.

under a single curve and above a straight line. Where one word occurs, we use the double ogee, which is made by uniting two ogee curves, as shown in Fig. 44.

In many designs, the inclined straight lines are used, as shown in (*a*) of Fig. 45, or diminished in width from the outside to the center of the inscription, as shown in (*b*) of the same figure.

While these and many other lines and curves are used in designing an inscription, several straight lines of lettering



(*a*) FIG. 45. (*b*)

require a great amount of skill in equalizing and arranging them properly, even in straight lines. In such designs only one style of letter (but made of various sizes, as the arrangement may require) is often used throughout the inscription.

RIBBONS.

87. The Ribbon.—The ribbon is used in many forms, and can be made to suit almost any style of inscription by folding or extending. When folded, the part representing the back of the ribbon is called the *return*, and must be shown by color or shading. The ribbon is made either in a regular curve or with irregular and broken edges. Fig. 46 shows the ribbon in some of its many forms, of which the names of its component parts are as follows: *a*, the bow; *b*, the broken band; *c*, the regular band; *d*, the returning band; *e*, the streamer; and *f*, the roll.

The ribbon is used also in a square or geometrical form, in which case the graceful and natural wave does not enter, as shown in Fig. 47. This form of ribbon serves its place in conventional or set designs.

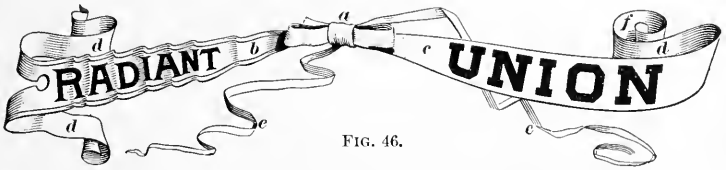


Fig. 46.

The ribbon is used also in the same form as the double ogee, and when thus used it must be made symmetrical on both ends. The fold can also be made in middle of ogee, as shown in Fig. 48, without distorting its symmetrical effect, but rather

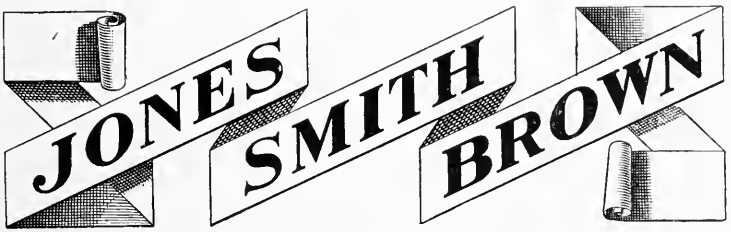


Fig. 47.

giving it ease and grace, which should always be the aim of the designer.

88. Shading the Ribbon.—In shading a ribbon, to make it appear natural always observe the law of light and

Fig. 48.

shade. If the light should strike on one part of the ribbon, the opposite side corresponding with it must necessarily be in shadow.

The study of light and shade is the first principle of design,

and has been considered with reference to individual letters under the head of "Shading." In designing, as in drawing from nature, strict adherence to this law is absolutely necessary, as the slightest disregard of it is noticeable to the skilled eye. We have seen the advantage of shading single letters to the left, and it is well to practice the shading of designs on the left also, in order to avoid such mistakes as are likely to occur, by showing a shade on two opposite sides of an object or of several objects, when they are combined to form one single design.

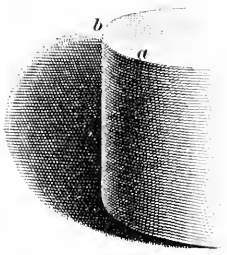


FIG. 49.

89. Reflected Light.—In the shading of ribbons or any rounded object, there occurs what is called the *reflected light*. It shows the edge or line which, without the observance of this principle, would otherwise be lost where the darkest shaded parts come together. Fig. 49 shows this principle of reflected light, the greatest strength of the shade being somewhat removed from the extreme edge of the object, as at *a*, while the shadow cast by the object itself is strongest against the edge at *b*.

PANELS.

90. Rectangular Panels.—The panel has more forms than the ribbon, and is made to serve many purposes. The

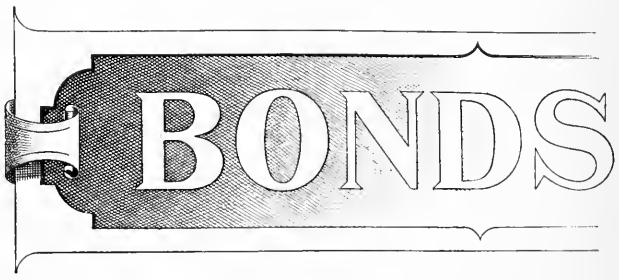


FIG. 50.

simplest form is that of a rectangle, within which is sometimes drawn an inner panel of the same, or different, shape shown in Fig. 50. The surroundings of the panel can be made either

simple or elaborate, as the material at hand in this style of design is inexhaustible. One of the many forms of the exterior of the panel is such as shown in Fig. 51. This work may be

FIG. 51.

so elaborated that the inner panel on which our lettering is to be placed becomes of minor importance, as shown in Fig. 52. This, of course, is not such a design as should be used to display a conspicuous inscription. We must, therefore, keep in

FIG. 52.

mind the fact that the inscription, if important, is of greater value than the ornamentation, the latter being employed only to embellish it, without detracting from its prominence.

91. Part Panels.—Another form of panel is that which is combined with some other design, in which the panel is not in the foreground of our design, as shown in Fig. 53. When the panel is left unfinished on one end, as in Fig. 53, it is known as a part panel, and many beautiful effects can be produced by its use. In this the damask principle is used, the panel being blended into the ground by means of color or with the pen. The lettering is also blended; the extreme of light color is thus contrasted against the darkest part of the panel,

FIG. 53.

and the dark lettering is continued on the light ground outside of the panel.

92. Elliptical and Round Panels.—Elliptical and round panels are also used and can be made extremely ornamental. A touch of simple ornament in a design will often counterbalance a quantity of plain work, and give a general effect of ornamentation throughout. Fig. 54 shows an elliptical design, with simply a frame of ornamentation, which is sufficient for the purpose of ornamenting a design; when such work is placed on other plainer material in a design, it gives the whole the appearance of completeness.

93. Rococo Panels.—Another style of panel that has come into our modern designs is the rococo panel; not only is the scrollwork used for the panel itself, but it is frequently applied to the embellishment of many parts of the design.

Fig. 55 shows one of the great variety of shapes the rococo panel assumes, as this style can be made to conform to the

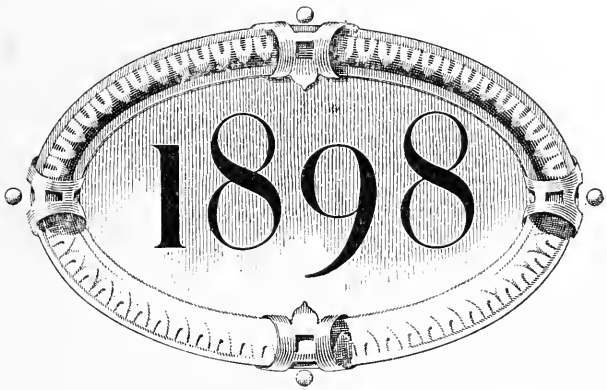


FIG. 54.

lines of any inscription, or to form a part of nearly any style of a design.

The same style of scroll is frequently used for the purpose of filling up an open space in a design, although this is done also through the employment of natural forms, such as palms, olive or laurel branches, flowers, leaves, and conventional objects, vases, lamps, lions, griffins, etc., and, in fact, any object pertaining to, or in harmony with, the inscription. If the inscription of a design pertains to music, the lyre may be used to embellish the design; if it pertains to the trades, such tools as are identified with the trades may appear in the design. If literature or science is the subject, symbolic objects

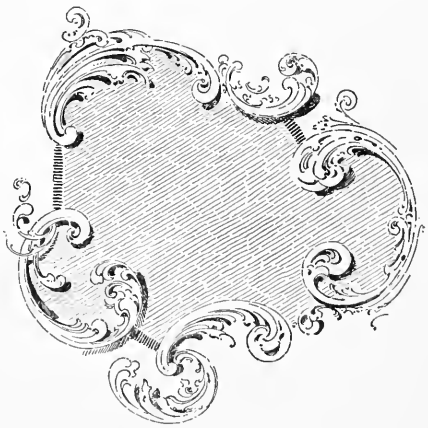


FIG. 55.

can be used in a variety of ways. A large collection of choice designs should always be on hand for reference, from a review of which a suggestion may often be obtained that leads the designer's thought into an original channel, which, as we have stated before, is the chief aim of the designer.

INSCRIPTION DESIGNING.

94. Proportion.—A piece of lettered work, no matter how artistic or elaborate it may be in itself, is not satisfactory if improperly proportioned or balanced. The tendency in design-

FIG. 56.

ing is to distribute the strength over the entire surface. If we keep in mind the law of art in a picture, it will help us in designing. The *foreground* should be the strength of a picture,

the *middle distance* should be the semistrength, while the *distance* should be indistinct. This is the key not only to successful designing, but also to satisfactory lettering. The top and bottom lines of the design shown in Fig. 56 are Roman ; the words "permanent" and "association" are styles of heavier face, while the strength of the inscription is centered in the two middle lines. The selection of the proper style of letters to suit each requirement should be carefully studied. A single word or line of letters can be made of any form or style, but as soon as another line is added the letterer is compelled to study their combinations, and to make their relation to each other harmonious to the eye and in proper proportion. In an inscrip-

FIG. 57.

tion of several words, the most important should be displayed in the most prominent style of letters, such as the Block or Egyptian, while the less important should be of smaller letters, and of such styles as one-stroke letter, or caps and lower case of the Roman or other styles. This rule does not interfere with the general effect produced in Fig. 56. If it should happen that the inscription cannot be made to conform to one rule in designing, it is best to change the design accordingly. In Fig. 57 is shown a design of an inscription in which the first and last words are most important, and from which eight words therefore could be taken, and still in effect, the principal feature of the whole inscription would remain "Brown's Shoes"; these words, therefore, should have the greatest prominence by making them large and of a solid-stroke letter.

STENCIL PATTERNS.

PURPOSE OF STENCILS.

95. Letter Stencils.—The letterer is sometimes forced into competition with the printer, especially when handling a large order for advertising signs; the method of hand work, therefore, must be laid aside for something that will have the effect of hand work, and still be accomplished with more rapidity, observing, at the same time, cleanliness and finish when the work is completed. The stencil pattern most effectually fills this place, and is made to stencil either the letter or the background. The stencil for the former purpose is made by cutting out of paper or other material the greater portion of the letter, but allowing parts called "*ties*" to remain, as these tie the inside of the letter and parts likely to curl up when in use. A second stencil is also required, which is laid over the work done by the first stencil when it has dried, thereby covering up the spaces left by the ties, and thus making a solid and complete letter. The same rule is observed in regard to the "cutting-in" stencils, which are used to make the background, and leave the letters the original color of the surface on which the color is spread. Large ties are used for "cutting-in" stencils, reaching from the letter to the edge of the stencil or border. A second stencil, so cut as to overlap the edges of the ties, is also used, thereby completing the entire background, leaving the letter clear and distinct.

96. Variegated Grounds for Stenciled Letters.—The ground having been prepared and the inscription designed, the spaces occupied by each line of letters can be blended—a process known among letterers as *variegated stenciling.* This is accomplished by laying various colors on a ground, and blending them together. As colors are too strong for this purpose, two or three delicate tints are used, and are laid on horizontally, and without regard to where the color is placed, except where the letters show. In all cases, the selection of

the tints used to variegate the letters should be governed by the color to be used for the background, according to the rules of harmony and contrast.

MATERIAL FOR STENCILS.

97. Paper.—The toughest medium-weight Manila paper should be used for stencils, oiled thoroughly with boiled linseed oil, and allowed to stand at least twenty-four hours before coating both sides thinly with orange shellac. If a light quality of fiber board is used, no preparation is necessary. A sheet of glass laid on a perfectly even table provides a surface on which the stencil can be cut with a good steel knife sharpened to a thin point. It is well to mark the ties with some bright color, to avoid cutting through them, as a single tie cut through destroys the whole stencil, and an imperfect stencil will cause more bother in its use than it is worth. It is best, therefore, never to use a patched or repaired stencil.

98. Tin-Foil Stencils.—Tin-foil stencils for glass sign printing are designed and cut in the same way as the paper. A roller only is used in operating this stencil, while either brush or roller can be used with the paper stencil. A large soft brush will produce better results than a stiff brush, and be less likely to destroy the pattern. In dipping the brush in color, great care should be used to rub it out well, so that but little remains before applying to the stencil. This is the secret of cleanliness in stenciling.

99. Cutting Stencils.—Figs. 58 and 59 show one method of cutting stencils. First, Fig. 58 shows the stencil that makes the letter, allowing ties to remain where most strength is needed for the preservation of the stencil. This stencil being completed, a small triangle is cut in each corner, shown at *a*, called the *register*, or *guide*, by which the stencil can always be placed in proper position. This stencil is placed on material prepared for the No. 2 stencil, as shown in Fig. 59. Letters are either marked or stenciled with a brush, which should be almost free from color, so that the second stencil for the ties can be cut out,

allowing enough lap to fully insure its covering the open space, as shown in Fig. 59. Register, or guide, marks are cut in this stencil also, though these marks are never used except where a border color is to be placed afterwards, and serve only for

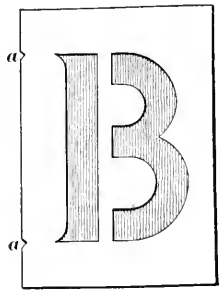


FIG. 58.

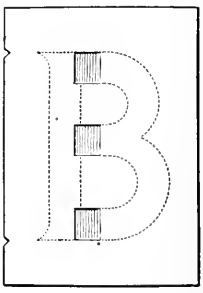


FIG. 59.

a second stencil. The edge or corner of a sign will, in most cases, serve as a guide in stenciling. Ties should always be cut so as to do away with points or projections as well as to secure strength where needed. If these rules are not followed, serious difficulty will be experienced when using a stencil, and may necessitate the making of a new stencil before the first one has been made to fully serve its purpose.

100. Background Stencils.—To make stencils for backgrounds, everything is reversed from the first form. The letters must be covered, and all ties cut so as to keep these letters where they belong. If a border is required, we must treat it the same as a letter. The ties must be cut wider on border edge, as they thereby give more strength where needed. In making this stencil it is

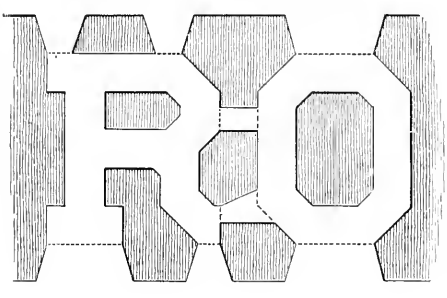


FIG. 60.

better to have too many ties than leave one place weak. The general tendency is to leave one or more such places in this form of stencil. Fig. 60 shows two letters R, O, and the ties necessary for strength and protection. Fig. 61 shows the No. 2 stencil, or the one to be used to cover spaces left by the ties of No. 1 ; the parts to be cut out are represented by the shaded spaces.

101. Sign Stenciling.—Stenciled signs are often relieved by a few touches of hand work, either in outlining the letters or by artistically using some bright coloring that produces the effect of study and labor. This is often accomplished by shading or ornamentation. For stencil work, a color must be used of a slow-drying nature, otherwise the stencil will soon become clogged and more liable to become broken. There is also danger of using color too thin, and thus causing it to flow underneath the edge of the letter, thereby destroying the cleanliness of the work.

102. Cleaning Stencils.—The stencil must be cleaned often when in use. Not more than five or six signs should be stenciled before cleaning the stencil, which may be done by laying it face down on a clean board or other surface and rubbing well on back with a cloth rolled in ball shape. The stencil must be thoroughly cleaned with benzine after using, and never put away with any color remaining on it. This if neglected will either cause the stencil to break easily, or the color to flow underneath by the extra thickness of the dried color. Color left to dry on the stencil often warps it so as to render it practically useless, or cause the letterer much unnecessary trouble.

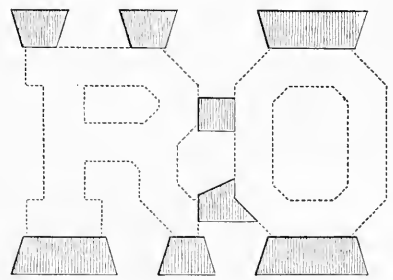


Fig. 61.

GEOMETRICAL FIGURES.

TRIANGLES.

103. Definition of Triangle.—A triangle is a closed figure having three angles and three straight sides.

104. Isosceles Triangles.—An isosceles triangle has two *equal* sides and two *equal* angles (Fig. 62). The length of

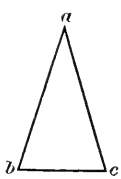


FIG. 62.

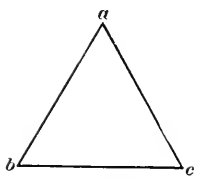


FIG. 63.

the third side is usually different from that of the two equal sides, and is called the *base*. The term base is, however, applied without distinction to any side on which a triangle is supposed to stand.

105. Altitude.—Whatever side is taken as the base of a triangle, the altitude, or height, of the triangle is the perpen-

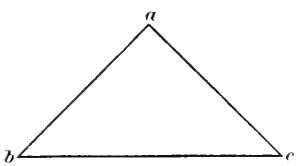


FIG. 64.

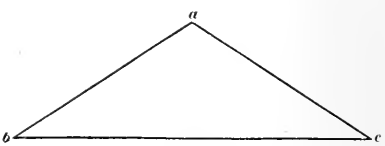


FIG. 65.

dicular distance from the base to the vertex of the opposite angle. That vertex is also called the *apex* of the triangle.

106. Angular Pediment.—When the height of an isosceles triangle is short in comparison with the base, the triangle is called an angular pediment (Fig. 63).

107. Gable.—A gable is an isosceles triangle whose equal sides differ but little from the third side (see Fig. 64). Gables, however, may also have the shape of Fig. 65.

108. Equilateral Triangle.—An equilateral triangle has three equal sides and three angles, as in Fig. 66, which is made up of equilateral triangles.

109. Right-Angled Triangle.—A right-angled triangle is one having one right angle (Fig. 67). The side opposite the right angle is the longest, and is called the *hypotenuse*.

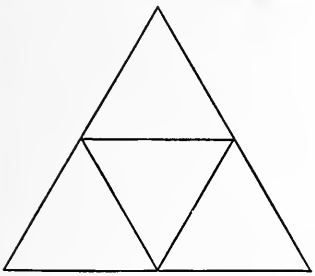


FIG. 66.

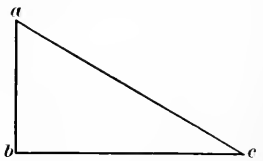


FIG. 67.

A triangle cannot have more than one right angle, nor more than one obtuse angle; that is, if one of the angles is either right or obtuse, the others must be acute.

CIRCLES.

110. Definition of Circle.—A circle is a closed figure, all the points of whose outline are at the same distance from a point within called the *center* (Fig. 68). The term *circle* is applied both to the curved outline of the figure and to the space enclosed by it; but the curved outline is more commonly called the *circumference* of the circle.

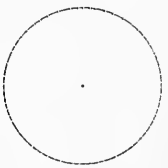


FIG. 68

111. Radius and Diameter.—The distance from the center of a circle to any point on the circumference is called the *radius* of the circle.

A line through the center of a circle, and having its ends on the circumference, is called a *diameter*. In Fig. 69, O is the center of the circle, OB, OD, OA, and OC are radii, AB and CD are diameters.

Every diameter is equal to two radii, and divides the circle into two equal parts, or *semicircles*, and the circumference into two *semi-circumferences*.

Two diameters, perpendicular to each other as *A B* and *C D*, divide the circumference into four equal parts called *quadrants*.

112. A Curve.—A *curved line*, or a *curve*, is a line no part of which is straight; it may be imagined to be formed by the bending of a straight line. Any portion of a curve is called an *arc*.

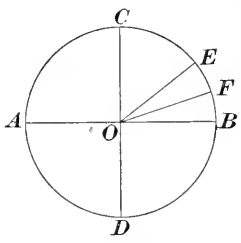


FIG. 69.

113. A Circular Arc.—A circular arc is any part of a circumference. Circular arcs having the same center, but different radii, are called *parallel* arcs. They are inside one another. They are also called *concentric*, which means "with the same center."

ORNAMENTAL CURVES.

114. An Ogee.—An ogee is a line curved in two ways, having, approximately, the form of the letter S, either in its


FIG. 70.


FIG. 71.

natural position, as in Fig. 70, or turned over, as in Fig. 71. The two parts of an ogee may be circular arcs, but arcs of other

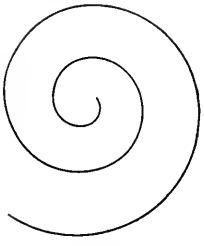


FIG. 73.

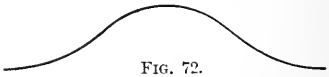


FIG. 72.

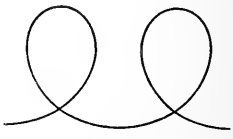


FIG. 74.

curves give a better effect. Fig. 72 is made up of two ogees, and is called a *swell line*.

115. A Scroll.—A scroll is a winding curve, such as shown in Fig. 73.

116. A Loop.—A loop (Fig. 74) consists of two curves similar to the corresponding parts of right and left scrolls, connected as shown.

THE ELLIPSE.

117. Methods of Describing an Ellipse.—There are many ways of making or describing an ellipse, some of which are quite complicated. For designing purposes, exclusive of architectural work, a knowledge of two or three methods will serve every purpose, and fill the needs of the average letterer and designer. The simplest method is by means of two tacks and a string; or, if needed for landscape gardening or other large-proportioned work, use hemp cord and nails or pegs. Draw a horizontal line, and intersect equally with a vertical line; point off on the horizontal line the length of ellipse desired; divide the horizontal line, from this point to the vertical line, into four equal parts, and place the tack on the third point from the vertical on either side; place the other tack also in a corresponding position opposite; place a string around both tacks, and tie the ends together at the point farthest from the vertical on the horizontal line; place lead pencil inside and follow around, and we have a perfect ellipse as a result, as shown in Fig. 75. By moving the tacks farther away from the vertical line, the ellipse is elongated, if the same string be used.

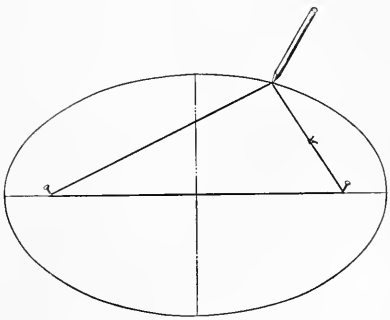


FIG. 75.

118. To draw the ellipse shown in Fig. 76, construct two squares, and draw lines from the corners intersecting in the center of each square; from this point of intersection, describe the

arcs, with compass from a to b; from the points c, describe upper and lower lines from a to a and b to b.

119. Another simple form of the ellipse is made by describing two circles, which together form the length of the ellipse, and drawing a horizontal line through the centers of both circles, as in Fig. 77; each semicircle is then divided into three equal parts, as at a, a, a, a, and a line is drawn from each through the center of each circle, meeting at the point b; from this point describe the curve from a to a, top and bottom, and the resulting figure will be an approximate ellipse. The ellipse is sometimes spoken of as an *oval*. This word, however, is a misnomer, as the oval derives its name from the Latin *ovum*, meaning "an egg," and its shape is the outline of an egg. Never refer to the oval therefore as an egg-shaped oval, for the statement would be equivalent to speaking of a round circle.

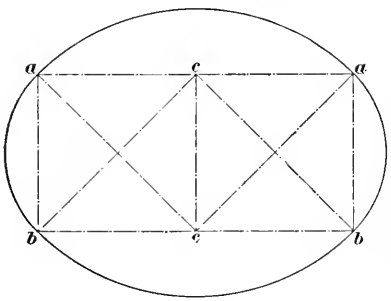


FIG. 76.

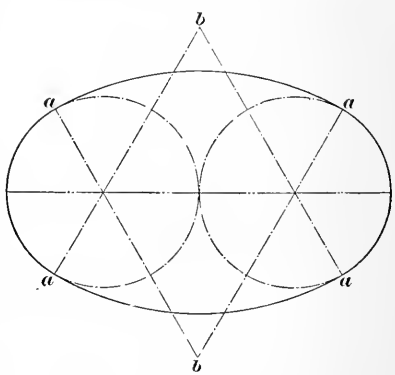


FIG. 77.

MODIFICATIONS OF THE FUNDAMENTAL STYLES.

120. The various styles of alphabet included in this course are known as the *fundamental* styles, from which arise other styles that, though they resemble the above somewhat, have so little characteristic modification that they are scarcely worth our present consideration. Moreover, these alphabets are of

little advantage to the student, but to avoid the danger of confusion, we will briefly refer to a few of the principal varieties.

121. Latin Roman.—The characteristic feature of the original Latin Roman alphabet was its irregularity, which is plainly shown on the Arch of Titus, Fig. 1. No space is allowed between the words, the separation being implied by a dot on a line with the center of the letter. The tail of the R and the Q often projects the full width of the letter. The letter V was also employed to express the sound of U, but its modern use in that capacity by some designers is erroneous. The other sound of this character in Latin resembles that of our W, having somewhat the sound of the V instead of the U. Hence, the origin of the W, which is not derived from U but from V, and originally written VV, expressed by two separate characters.

122. Ancient Roman.—The Ancient Roman is the prototype of our present French Roman, but in many ways is so departed from in modern practice that some of the modified forms of letters have become more familiar than the originals.

FIG. 78.

This can be readily seen in the letter A, Fig. 78, where (*a*) is the original form and (*b*) the modification.

123. Antique Egyptian.—There are several forms of each letter of the Antique Egyptian, which if seen by the student in connection with the regular or normal letter would tend to confuse him, or at least cause him to inquire why he should observe any system or regularity of form. The law of uniformity is, in lettering, what the *order* is in architecture; each must be closely followed, or to the skilled eye the work is subject to criticism. These styles, therefore, must not be confused. If one form is adopted there must be strict adherence

to that form throughout the lettering of the design. This may be more clearly shown by two or three of these forms of the capital letters and their corresponding lower case. When the slanting stroke is used in such letters as H, M, N, and V, it also occurs in many of the lower-case letters, as a, d, h, m, n, and u, as the letters N, a, d, in Fig. 79, will show. The letter o is sometimes used in this style, as here shown, and the letter t is crossed above the line.

Fig. 79.

124. Other Forms of Antique Egyptian.—Another form of the Antique Egyptian style is shown in the curved stroke, in place of the horizontal middle stroke, of many capital and lower-case letters, as in the E and t in Fig. 80; while a change in the spur of the horizontal strokes changes the character of the entire letter, as shown in the letters L and T, Fig. 81.

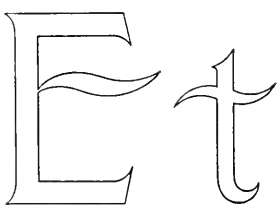


Fig. 80.

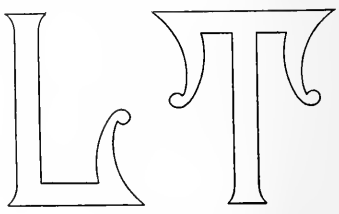


Fig. 81.

There are many other slight departures from the normal style, one of which occurs in the middle bar of the A and H, as shown in Fig. 82.

Fig. 82.

There is still another form of letter that belongs to the *Plain Egyptian* style. This form is simple in its construction, and does not bear sufficient distinction to classify it with the fundamental styles; but in one respect, this form of letter is closely allied to the French Roman, and the similarity is shown in its having the heavy and light line, as shown in Fig. 83.

A few letters of this style are therefore shown to give the student an idea of the comparative width of the stroke and fine line. The latter should not exceed $\frac{1}{3}$ that of the stroke. There is almost unlimited license granted in forming these

FIG. 83.

letters, as shown in the two letters T and E. In making these letters never place a spur on any part of the letter, as this at once throws the characteristic feature of the style in favor of the French Roman; and to widen the fine line to nearly that of the stroke brings it within classification limits of the Egyptian. Never show a suggestion of a straight line on the inside of the round letters, but always make a perfect ellipse or a symmetrical curve. This letter holds an important place with our modern designers, but a knowledge of the Egyptian and French Roman only is necessary to produce this modification. This is likewise true of all letters used. By a thorough knowledge of the few fundamental styles, the student can readily trace all variations arising from these to their parent style.

125. Boston Roman.—The Boston Roman has a slight variation from the normal form shown in Plate 14 which occurs in the spur only, but which gives it a marked difference in appearance from the regular style. The spur, instead of being finished on the end, as shown in Plate entitled Boston Roman, is cut off on an angle of about 45°, as shown in Fig. 84.

FIG. 84.

126. Antique Half Block.—A third style, known as the Antique Half Block, has two or three varieties. Such of the capitals, as well as the small letters, as possess a middle stroke have this stroke changed to an angle of 60°. In one

variety the short strokes of the lower-case letters are cut on the same angle as the middle stroke, as shown in Fig. 85, the angle

Fig. 85.

Fig. 86.

of the s being directly opposite. Another variety of this letter is the same as Fig. 85, except that the short strokes are altered in appearance, and are finished with a fine line and a dot, as

Fig. 87.

shown in Fig. 86. This form of letter can be spaced more closely than the regular style used in condensed spaces, and the variety shown in Fig. 87 requires even less space than either

(a) *(b)* *(c)*

Fig. 88.

of the others; and, as the corners are not cut off, the letter possesses a square, compact appearance, somewhat relieved of severity by the finishing of the corners with a slight spur. The

same rule of formation applies to capitals as well as to lower-case letters, except the middle bars of E and F, which are always horizontal.

127. French Roman.—The French Roman is also in turn slightly changed, giving rise to several distinct varieties, as shown in Fig. 88. In the letter E, shown at (*a*), the only difference from the Ancient Roman style is the spur that projects at a right angle from the horizontal lines top and bottom. In the letter shown at (*b*) the spurs are the same as at (*a*), except those of the main upright strokes, which are finished with a flat end. The round letter of this style is shown at (*c*).

Fig. 89.

128. The Flemish.—The Flemish or Dutch, so closely resembling the German Text, is another style that will not be considered in this course. The characteristic feature of this alphabet is the diamond, dot, and plain vertical stroke and fine line, as shown in Fig. 89, its other features being practically the same as the German style. In the lower-case very little change

Fig. 90.

occurs except the ball, which is added to many of the long-stroke letters, as shown in the figure.

129. Variations.—There are so many styles of letters, arising from some simple idea, that any student of lettering may apply to a fundamental style; and such ideas are so numerous, that it will be impossible to call attention to more than one or two of these in conclusion.

The curved stroke is one such style, and is shown by the letters D, R, U, G, in Fig. 90. Another of these styles is pro-

FIG. 91.

duced by curving the spur and horizontal strokes forming the block letters, especially the full block, as shown in Fig. 91.

NOTE.—*The modifications considered in the foregoing pages of this Instruction Paper refer to fundamental styles, many of which the student will not have occasion to refer to, or make comparisons with until well advanced in his course, we would advise, therefore, that a study of these variations be deferred until the plates mentioned in this connection have been received, and the fundamental styles have become familiar to the student.*

MECHANICAL LETTERING.

130. When instruments such as the **T** square, triangles, compasses, etc. are used to execute lettering, it is called *mechanical lettering*, as distinguished from *freehand lettering*,

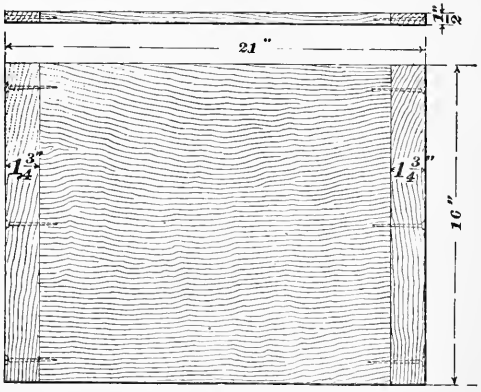


FIG. 92.

which is executed with the pen or brush, unaided by anything except the judgment of the eye.

131. All the instruments and materials required for this course in lettering are mentioned in the following descriptions:

The **drawing board** should be made of well-seasoned straight-grained pine, the grain running lengthwise. For this course, the student will need a board of about the following dimensions: length over all, 21 inches; width, 16 inches; the thickness may be made about $\frac{1}{2}$ inch. There should be two end-pieces $1\frac{3}{4}$ inches wide, as shown in Fig. 92, which are fastened to the board proper by means of nails or screws. One or both of these pieces should be perfectly straight.

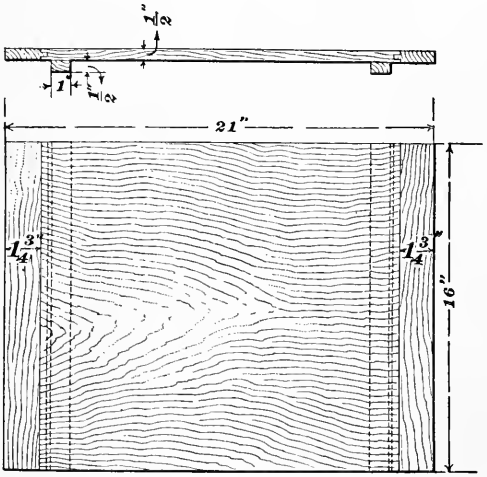


Fig. 93.

A better board is shown in Fig. 93; here the end-pieces are fastened to the board by a glued matched joint in addition to the nails or screws, and there are two cleats on the bottom 1 inch by $\frac{1}{2}$ inch, extending the whole width of the board. The cleats raise the board from the table and make it easier to change in position. The board is placed so that a straight end-piece is at the left of the draftsman, as shown in Fig. 93.

132. The **T square** is used for drawing horizontal straight lines. The head *A* is placed against the left-hand edge of the

board, as shown in Fig. 94. The upper edge *C* of the blade *B* is brought very near to the point through which it is desired to pass the line, so that the straight edge *C* of the blade may be

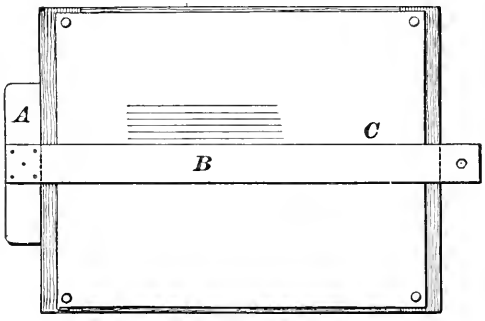


FIG. 94.

used as a guide for the pen or pencil. It is evident that all lines drawn in this manner will be parallel.

Vertical lines are drawn by means of triangles. The triangles most generally used are shown in Figs. 95 and 96. Each has one right angle, marked 90° in the figures. Fig. 95 has two

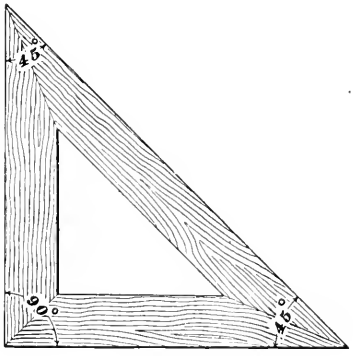


FIG. 95.

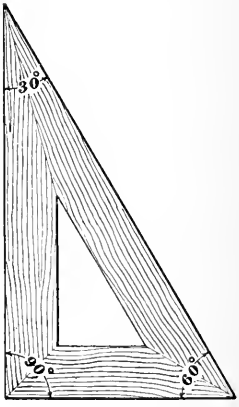


FIG. 96.

angles of 45° each, and Fig. 96 one of 60° and one of 30°. They are called *45° and 60° triangles*, respectively. To draw a vertical line, place the **T** square in position to draw a horizontal line, and lay the triangle against it, so as to form a right angle.

Hold both T square and triangle lightly with the left hand, so as to keep them from slipping, and draw the line with the pen or pencil held in the right hand, and against the edge of the triangle. Fig. 97 shows the triangles and T square in position.

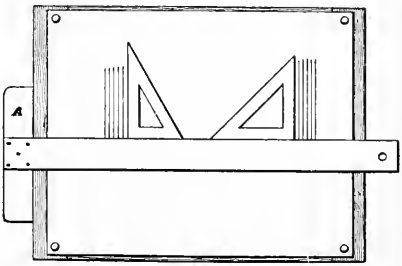


FIG. 97.

133. For drawing parallel lines that are neither vertical nor horizontal, the simplest and best way, when the lines are near together, is to place one edge of a triangle, as $a\,b$, Fig. 98, on the given line $c\,d$, and lay the other triangle, as B, against one of the two edges, holding it fast with the left hand; then move the triangle A along the edge of B. The edge $a\,b$ will be parallel to the line $c\,d$; and when the edge $a\,b$ reaches the point g, through which it is desired to draw the parallel line, hold both triangles stationary with the left hand, and draw the line $e\,f$ by passing the pencil along the edge $a\,b$. Should

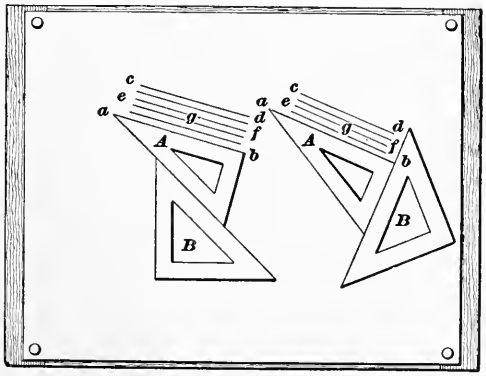


FIG. 98.

the triangle A extend too far beyond the edge of the triangle B after a number of lines have been drawn, hold A stationary with the left hand and shift B along the edge of A with the right hand, and then proceed as before.

134. A line may be drawn at right angles to another line which is neither vertical nor horizontal, as illustrated in Fig. 99. Let $c\,d$ be the given line (shown at the left-hand side). Place one of the shorter edges, as $a\,b$, of the triangle B so that it will coincide with the line $c\,d$; then, keeping the triangle in this position, place the triangle A so that its long edge will come against the long edge of B. Now, holding A securely in place with the left hand, slide B along the edge of A with the right hand, when the lines $h\,i$, $m\,n$, etc. may be drawn perpendicular to $c\,d$ along the edge $b\,f$ of the triangle B. The dotted lines

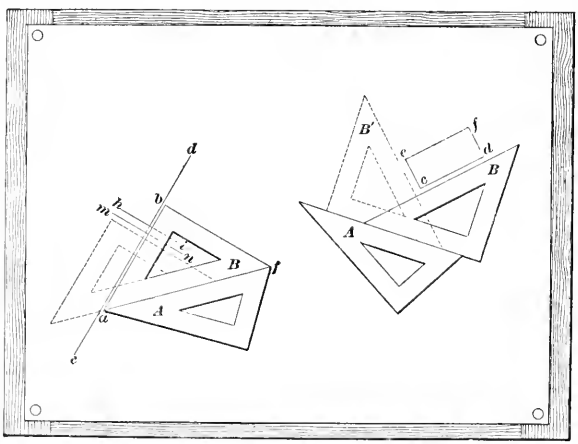


Fig. 99.

show the position of the triangle B when moved along the edge of A.

135. The right-hand portion of Fig. 99 shows another method of accomplishing the same result, and illustrates how the triangles may be used for drawing a rectangular figure, when the sides of the figure make an angle with the T square such that the latter cannot be used.

Let the side $c\,d$ of the figure be given. Place the *long* side of the triangle B so as to coincide with the line $c\,d$, and bring the triangle A into position against the lower side of B, as shown. Now, holding the triangle A in place with the left hand, revolve B so that its other short edge will rest against the long edge A,

as shown in the dotted position at B'. The parallel lines ce and df may now be drawn through the points c and d by sliding the triangle B on the triangle A, as described in connection with Fig. 98. Measure off the required width of the figure on the line ce, reverse the triangle B again to its original position, still holding the triangle A in a fixed position with the left hand, and slide B upon A until the long edge of B passes through e. Draw the line ef through the point e, and ef will be parallel to cd. The student should practice with his triangles before beginning drawing.

136. The **compasses,** next to the **T** square and triangles, are used more than any other instrument. A pencil and a pen point are provided, as shown in Fig. 100, either of which may be inserted into a socket in one leg of the instrument, for the drawing of circles in pencil or ink. The other leg is fitted with a needle point, which acts as the center about which the circle is drawn. In all good instruments, the needle point itself is a separate piece of round steel wire, held in place in a socket provided at the end of the leg. The wire should have a square shoulder at its lower end, below which a fine, needle-like point projects. The *lengthening bar*, also shown in the figure, is used to extend the leg carrying the pen and the pencil points when circles of large radii are to be drawn.

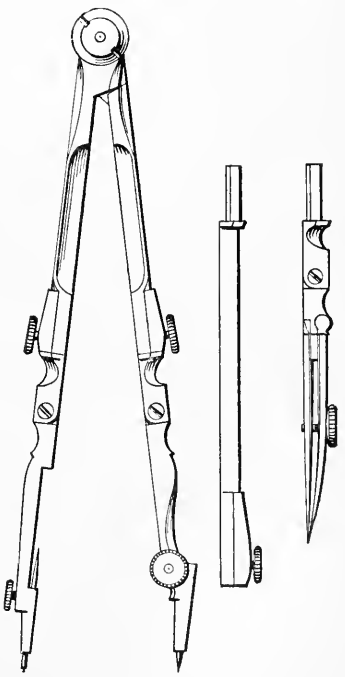


FIG. 100.

The joint at the top of the compasses should hold the legs firmly in any position, and at the same time should permit their being opened or closed with one hand. The joint may be

tightened or loosened by means of a screwdriver or wrench, which accompanies the compasses.

It will be noticed in Fig. 100 that each leg of the compasses is jointed; this is done so that the compass points may always be kept perpendicular to the paper when drawing circles, as in Fig. 102.

137. The following suggestions for handling the compasses should be carefully observed by those that are beginning the subject of drawing. Any draftsman or letterer that handles his instruments awkwardly will create a bad impression, no

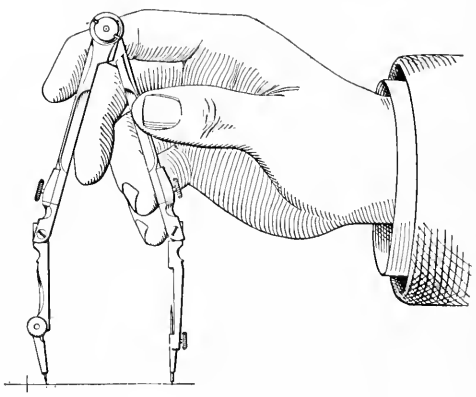


FIG. 101.

matter how good a workman he may be. The tendency of all beginners is to use both hands for operating the compasses. This is to be avoided. The student should learn at the start to open and close them with one hand, holding them as shown in Fig. 101, with the needle-point leg resting between the thumb and the fourth finger, and the other leg between the middle finger and the forefinger. When drawing circles, hold the compasses lightly at the top between the thumb and forefinger, or thumb, forefinger, and middle finger, as in Fig. 102. Another case where both hands should not be used is in locating the needle point at a point on the drawing about which the circle is to be drawn, unless the left hand is used merely to steady the needle point. Hold the compasses as shown in Fig. 101, and

incline them until the under side of the hand rests upon the paper. This will steady the hand so that the needle point can be brought to exactly the right place on the drawing. Having placed the needle at the desired point, and with it still resting on the paper, the pen or pencil point may be moved out or in to any desired radius, as indicated in Fig. 101. When the lengthening bar is used, both hands must be employed.

138. The compasses must be handled in such a manner that the needle point will not dig large holes in the paper.

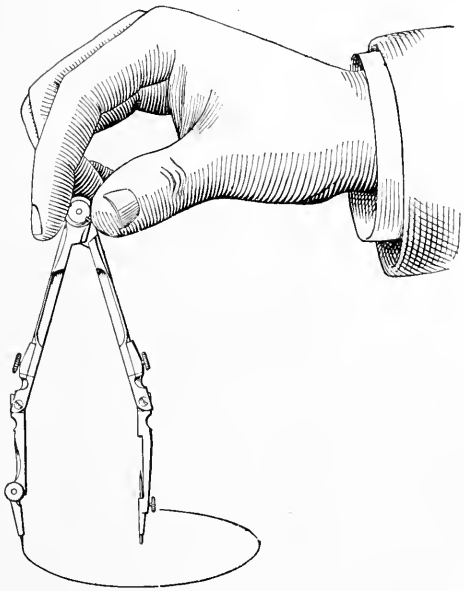


FIG. 102.

Keep the needle point adjusted so that it will be perpendicular to the paper, when drawing circles, and *do not bear upon it.* A slight pressure will be necessary on the pen or pencil point, *but not on the needle point.*

139. The **dividers,** shown in Fig. 103, are used for laying off distances upon a drawing, or for dividing straight lines or circles into parts. The points of the dividers should be *very* sharp, so that they will not punch holes in the paper larger

than is absolutely necessary to be seen. Compasses are sometimes furnished with two steel divider points, besides the pen and pencil points, so that the instrument may be used either as compasses or dividers. This is the kind illustrated in Fig. 103. When using the dividers to space a line or circle into a number of equal parts, hold them at the top between the thumb and the forefinger, as when using the compasses, and step off the spaces, turning the instrument alternately to the right and left. If the line or circle does not space exactly, vary the distance between the divider points and try again ; so continue until it is spaced equally. When spacing in this manner, great care must be exercised not to press the divider points into the paper ; for, if

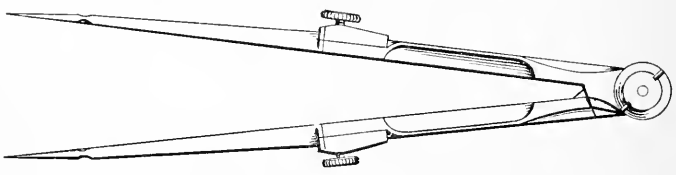


FIG. 103.

the points enter the paper, the spacing can never be accurately done. The student should satisfy himself of the truth of this statement by actual trial.

140. Drawing Paper and Pencils.—The drawing paper required for this series of lessons is Whatman's hot-pressed $\frac{1}{2}$ Royal, the size of which is 12 in. $\times$ 19 in. It takes ink well, and withstands considerable erasing. The paper is secured to the drawing board by means of *thumbtacks*. Four are usually sufficient—one at each corner of the sheet. Place a piece of paper on the drawing board, and press a thumbtack through one of the corners about $\frac{1}{4}$ or $\frac{3}{8}$ of an inch from each edge. Place the T square in position for drawing a horizontal line, as before explained, and straighten the paper so that its upper edge will be parallel to the edge of the T-square blade. Pull the corner diagonally opposite that in which the thumbtack was placed, so as to stretch the paper slightly, and push in another thumbtack. Do the same with the remaining two corners. For drawing in pencil, a Dixon's Artists' H pencil, No. 217 (commonly called a No. 4 Dixon's Artists') may be

used. The pencil should be sharpened to a medium point. Cut the wood away so as to leave about $\frac{1}{4}$ or $\frac{3}{8}$ of an inch of the lead projecting; then finish the point by rubbing it against a fine file or a piece of fine emery cloth or sandpaper that has been fastened to a flat stick. The lead for the compasses should be sharpened to a flat or chisel-shaped point. *Be sure that the*

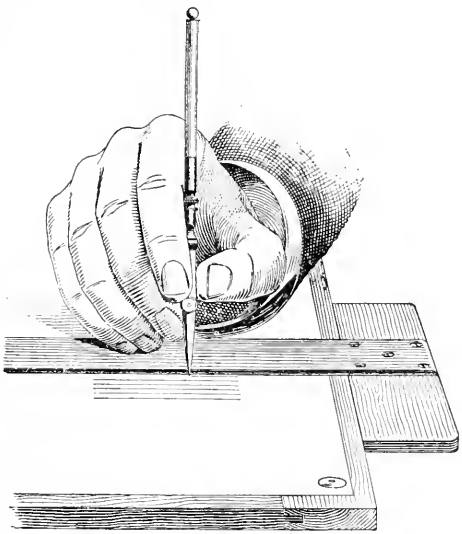


FIG. 101.

compass lead is so secured that, when circles are struck in either direction, but one line will be drawn with the same radius and center.

141. Inking.—For drawing ink lines other than arcs of circles, the **ruling pen** (or *right-line pen*, as it is sometimes called) is used. It should be held as nearly perpendicular to the board as possible, with the hand in the position shown in Figs. 104 and 105, bearing lightly on the **T** square or triangle, against the edge of which the line is drawn. After a little practice, this position will become natural, and no difficulty will be experienced.

142. The beginner will find that it is not always easy to make smooth lines. If the pen is held so that only one blade bears on the paper when drawing, the line will almost invariably

be ragged on the edge where the blade does not bear. When held at right angles to the paper, as in Fig. 105, however, both blades will rest on the paper, and if the pen is in good condition, smooth lines will result. The pen must not be pressed against the edge of the T square or triangle, as the blades will then close together, making the line uneven. The edge should serve simply as a guide.

In drawing circles with the compass pen, the same care should be taken to keep the blades perpendicular to the paper

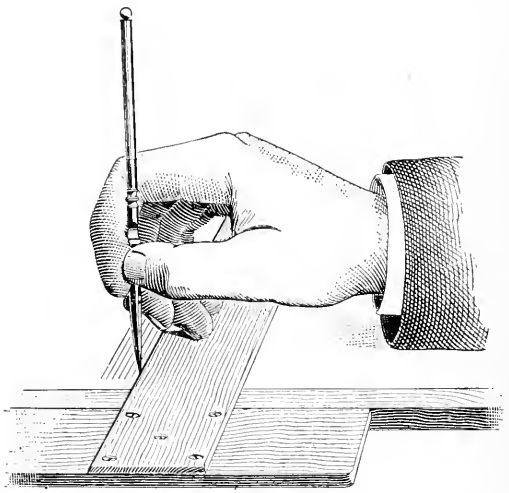


Fig. 105.

by means of the adjustment at the joint. In both the ruling pen and the compass pen, the width of the lines can be altered by means of the screw which holds the blades together.

143. Drawing Ink.—The ink used should be Higgins' waterproof liquid India ink. A quill is attached to the cork of every bottle of this ink, by means of which the pen may be filled. Dip the quill into the ink, and then pass the end of it between the blades of the drawing pen. Do not put too much ink in the pen, not more than enough to fill it for a quarter of an inch along the blades, otherwise the ink is liable to drop. Many draftsmen prefer to use stick India ink; and, for lettering

purposes, this is to be preferred to the prepared liquid ink recommended above. In case the stick ink is bought, put enough water in a shallow dish (a common individual butter plate will do) to make enough ink for the drawing; then place one end of the stick in the water, and grind by giving the stick a circular motion. Do not bear hard upon the stick. Test the ink occasionally to see if it is black. Draw a fine line with the pen, and hold the paper in a strong light. If it shows brown (or gray), grind a while longer, and test again. Keep grinding until a fine line shows *black*, which will usually take from fifteen minutes to half an hour, depending on the quantity of water used. The ink should always be kept well covered with a flat plate of some kind, to keep out the dust and prevent evaporation. The drawing pen may be filled by dipping an ordinary writing pen into the ink and drawing it through the blades, as previously described when using the quill. If Higgins' ink is used, all the lines on all the drawings will be of the same color, and no time will be lost in grinding. If stick ink is used, it is poor economy to buy a cheap stick. A small stick of the best quality, costing, say, a dollar, will last as long, perhaps, as five dollars' worth of liquid ink. The only reason for using liquid ink is that all lines are then sure to be of equal blackness, and time is saved in grinding.

Trouble will probably be caused by the ink drying between the blades and refusing to flow, especially when drawing fine lines. The only remedy is to wipe out the pen frequently with a wet cloth. Do not lay the pen down for any great length of time, when it contains ink; wipe it out first. The ink may sometimes be started by moistening the end of the finger and touching it to the point, or by drawing a slip of paper between the ends of the blade. *Always keep the bottle corked.*

144. To Sharpen the Drawing Pen.—When the ruling, or compass, pen becomes badly worn, it must be sharpened. For this purpose a fine oilstone should be used. If an oilstone is to be purchased, a small, flat, close-grained stone should be obtained, those having a triangular section being preferable, as the narrow edge can be used on the inside of the

blades in case the latter are not made to swing apart so as to permit the use of a thicker edge.

The first step in sharpening is to screw the blades together, and, holding the pen perpendicular to the oilstone, to draw it back and forth over the stone, changing the slope of the pen from downward and to the right to downward and to the left for each movement of the pen to the right and left. The object of this is to bring the blades to exactly the same length and shape, and to round them nicely at the point.

This process, of course, makes the edges even duller than before. To sharpen, separate the points by means of the screw, and rub one of the blades to and from the operator in a straight line, giving the pen a slight twisting motion at the same time, and holding it at an angle of about 15° with the face of the stone. Repeat the process for the other blade. To be in good condition the edges should be fairly sharp and smooth, but not sharp enough to cut the paper. *All the sharpening must be done on the outside of the blades.* The inside of the blades should be rubbed on the stone only enough to remove any burr that may have been formed. Anything more than this will be likely to injure the pen. The whole operation must be done very carefully, bearing on lightly, as it is easy to spoil a pen in the process. Examine the points frequently, and keep at work until the pen will draw both *fine* lines and *smooth* heavy lines.

HOW THE WORK SHOULD BE SENT.

145. For the letter plates of this Course, copies of the plates will be sent you as you need them. The tube we send you with this Paper should be used by you for sending us your drawing of Plate I upon finishing it. Send one plate to us at a time. Thus, after you finish the first plate, send it to us, and then start on the second plate. In the meantime we will return the first plate to you. On your receiving back the first plate from us, you should carefully note all corrections and suggestions that may be sent with it, and observe them when drawing the succeeding plates. On no account send us the second plate until you have received the first one back. Upon

finishing the second plate, send this to us and start on the third plate, and in the meantime we will return the second plate to you. Do this with all the drawing plates in the Course.

It is very essential that you strictly comply with these directions; since, otherwise, it will be impossible for us to point out your mistakes to you. This procedure should be strictly adhered to while you are drawing the first plates of the Course—it will enable you to make rapid progress. Do not be discouraged if there are a large number of corrections on your early plates; we are merely pointing out ways in which the drawing or lettering can be improved, so that your later plates may be as nearly perfect as they can be made. No one can attain proficiency unless the work is criticized, and we are doing our best to help you to succeed. We should not be doing our duty if we did not point out the defects. The *number* of corrections is no indication of our appreciation of the merits of the drawing.

On all plates that you send to us, write your name and address in full in lead pencil on the back of the plates. This should in no case be omitted, as delays in the return of your work will otherwise surely occur.

PLATES.

146. Preliminary Directions.—The size of each plate over all will be $11\frac{1}{2}$ in. $\times$ $18\frac{1}{4}$ in. Whenever any dimensions are specified, they should be laid off as accurately as possible. All drawings should be made as neat as possible, and the penciling entirely finished before inking in any part of it. The hands should be perfectly clean, and should not touch the paper except when necessary. No lines should be erased except when *absolutely* necessary; for, whenever a line has once been erased, the dirt flying around in the air and constantly falling on the drawing will stick to any spot where an erasure has been made, and render it very difficult, if not impossible, to entirely remove it. For this reason, all construction lines that are to be removed, or that are liable to be changed, should be drawn lightly, that the finish of the paper may not be destroyed when erasing them.

LETTERING

—AND—

SIGN PAINTING.

LETTERING AND SIGN PAINTING.

INTRODUCTION.

1. Scope of Subject.—Sign painting does not consist merely of painting letters on sign boards or windows, but includes all classes of work, from the plain black lettering on the glass of an office door to the most artistic pictorial designs used on banners and other elaborate gold and silver signs. The sign painter must also be prepared to execute all manner of designs for the carver and stone cutter, and even portraiture enters into his industry for such purposes as campaign and society banners.

2. Qualifications Necessary.—The sign painter should be a master of the art of designing, for, as we have already stated, under this head is embraced a general knowledge of all that is considered artistic. He should be thoroughly familiar with the use of colors, having due regard for their harmony and contrast, and also the many effects that can be produced by their unlimited combinations; he should also be familiar with the result of applying one color over another, when one has been prepared so as to dry slowly, and the other prepared to dry quickly and with the results produced by the varied preparation of the priming, groundwork, and finishing coats, the mixing of colors for certain backgrounds, or the treatment of the material on which he is to letter. These and a great many other subjects, which constantly arise, must be met and fully understood, to fulfil the demands made on the successful and up-to-date sign painter.

3. Experience and Theory.—While theoretical knowledge is the basis of all proficiency in the arts, yet much remains to be learned from experience. The physician is graduated from his college with a full knowledge of his profession, but his

year or two of hospital service is incumbent on him before he is fully qualified to engage in private practice. We have therefore given in the *Elements of Lettering* the knowledge necessary to qualify the student that desires to become a practical letterer. But the instruction contained in the following pages is of such a practical nature as to advance him in lettering; so that he may enter the sign shop beyond the year or two of servitude required, and, by a complete knowledge of the methods and formulas employed, be fitted to become at once of practical assistance to his employer.

PRACTICE AND MATERIAL.

4. Brush Work.—It is necessary that the student desiring to apply his knowledge of lettering especially to sign painting should become accustomed to the use of the brush and paint, by confining his practice to these materials as much as possible. It is only by constant practice that the hand becomes skilled in the use of the brush in forming straight lines and curves with accuracy, in order to give to each letter its proportionate width and uniform stroke.

5. Brushes Required.—The brushes for practice work should be as follows: the small brush, capable of making a letter from 3 to 6 inches in height, having a quill $\frac{1}{16}$ inch in diameter, and hair $\frac{3}{4}$ inch long; and the large brush, with a quill $\frac{1}{8}$ inch in diameter, and hair $\frac{7}{8}$ inch long. Cut off $\frac{1}{2}$ length of quill, after softening in warm water to prevent it from splitting. This will allow the handle (which must be carefully fitted in quill) to turn freely in the fingers without touching the quill with the ends of the fingers, which would, on account of the imperfect quill, roll unevenly in the fingers and thus destroy a perfect line or curve. The brush should be cleaned in turpentine before, as well as after, using; and, to prevent it from drying or hardening when not in use, it should be dipped in kerosene oil after cleaning.

6. Card Black.—The color known among letterers as *card black* will be found to be a good preparation for practice

work. This color flows freely from the brush, is an intense black, and dries with a glossy surface a few moments after the application. It may be prepared by the student as follows: Use a vessel that will hold at least $\frac{1}{2}$ pint; in this put coach black (ground in japan), in bulk, equal to a large English walnut; add three times this quantity of best asphaltum, also about a tablespoonful of best coach japan. Stir until thoroughly mixed, and thin this with a small quantity of turpentine until it becomes equal to the consistency of cream, or so that it will flow freely from the brush. Put this mixture in a large-neck bottle with screw-cap or cork top. This should always be well shaken before it is used. Another preparation known as "Letterine" is also an excellent mixture.

7. Paper.—The light Manila paper, white cardboard, or the ordinary white flat papers will serve the purpose for practice work. With the exception of cardboard, these should be securely fastened to the drafting table before beginning to practice.

METHODS USED IN SIGN PAINTING.

TOOLS NECESSARY.

GENERAL TOOLS AND APPLIANCES.

8. Principal Tools Necessary.—The principal tools necessary for sign painting and lettering are the T square, boxwood square, the compass with pencil attachment, straight-edge, yardstick, 30° and 45° triangles, easel, and drafting table. With these tools, one is prepared to letter all ordinary signs that may be executed within the shop; while those on the sides of buildings, too high to be reached with an ordinary ladder, require the use of a swing scaffold, tackle blocks, and ropes. Trestle horses and plank are also used for work above the reach of the step-ladder. The T square with swivel top and thumbscrew can be adjusted to any angle, and will be found a very useful tool. Three compasses, at least, should be used;

the largest (the wood compass) should be capable of an expansion of 3 feet. The sign easel should be made of extra-heavy material, as the weight put upon it is sometimes very heavy. The drafting table should be constructed high enough to avoid the necessity of the letterer getting into a stooping position when working. This table should be built 3 feet 2 inches high in front, and with the view of the letterer always standing up while working on it. For close work, which can be done as well, or better, while sitting, a lower table should be used, adjusted accordingly; in either case the incline should not exceed 6 inches rise in 20 inches width.

9. Improvised Appliances.—There are many tools and contrivances used in a sign shop that an inventive brain can always improvise, such as the arm rest, which is a strip about 3 inches wide by 1 inch thick, with blocks underneath each end, thick enough to raise this rest above the sign on which the letterer is working; the adjustable frame, on which cloth signs are stretched while being lettered, which is a frame usually fastened at each corner by setscrews; the glass sign racks, used to hold glass signs and insure their safety during the process of lettering; or the adjustable frame used to hold finished work, etc. The ordinary tools necessary in a sign shop, such as palette knives, palettes, etc., are too well understood to need any description. A solid table, with a firm, level top, about 18 in. × 24 in., covered with plate glass, will be found very useful in mixing colors; if made light and portable, this can be used conveniently by placing it beside the work on which the letterer may be engaged.

BRUSHES.

10. Camel's-Hair Brushes.—We will first consider the brushes to be used for lettering. Of those used exclusively for this purpose, the most common variety is the ordinary camel's-hair brush. These are the least expensive, and range in size from the $\frac{3}{64}$-inch, known as No. 7, to the "swan quill," which is the most stocky quill brush in use for lettering. The "goose

quills'' are made in four sizes, Nos. 7, 5, 3, 1. No. 1 is a $\frac{1}{2}$-inch quill with hair $1\frac{1}{4}$ inches long.

11. Ox-Hair Writers.—The ''ox-hair writers'' are similar to the camel's hair in size and numbers, but are harder to ''break in,'' or bring into perfect working order, and are used to best advantage in heavy color, such as white lead.

12. Superfine Brown-Sable Writers.—The ''superfine brown-sable writers'' are also of four sizes. Their numbers are 1, 4, 6, 8, and their lengths correspond with the camel's-hair brushes. These will be found excellent brushes, and when thoroughly broken in will give good service ; while the camel's hair are unreliable in lasting quality, but serve the purpose where the brown sable are of no use. This is especially true when used for lettering on japanned tins, glass, or other smooth surfaces.

13. Red-Sable Brushes.—For lettering in water colors as well as oil, the long-handled red-sable brushes are preferable. These range in sizes numbered from 1 to 12, successively. The hair of No. 1 is $\frac{1}{4}$ inch long, while that of No. 12 is $\frac{11}{16}$ inch long. These brushes are well made, and generally give satisfaction. The flat red-sable brushes are chisel-shaped, and for use in making a letter, such as the Old English, will be found of great advantage.

14. Swan Quill.—The swan quill (camel's hair) referred to, will be found invaluable, both in lettering and striping, on account of the great amount of color it can be made to retain. These brushes are used with light flowing color only, and to use them in any color made with white lead would ruin them at once. They are made especially for sign painters, in two sizes, $\frac{3}{4}$ inch and 1 inch long, and one size made for carriage stripers is 2 inches long.

15. Other Brushes.—The fitch and bristle varnish brushes are used for lettering on cloth signs, and other large letters ; and, on account of their size and chisel shape, can be used with great rapidity, and will give the work an appearance of neatness and cleanliness. The only other brushes used by

the sign painter are the *pound* brush, which is necessary to coat sign boards or other plain surfaces; the round and flat sash tools; the *fitch*, or flat bristle brush; and the flat *bear's-hair* brush (made exclusively for varnishing purposes). These constitute all the brushes required for sign painting and lettering, except the round *duster*, the several varieties of gilding brushes, blenders, stipplers, etc.

THE T SQUARE.

16. On all signs having either a square top or bottom, the **T** square can be used, not only for marking out the letters, but also for guiding the hand in using the brush, though to accomplish this perfectly requires much practice. It will be advisable, therefore, that the student take pains to acquire this method, and become accustomed to the position of the hand, and the manner in which the brush should be held. Fig. 1 shows this position. The brush is held between the thumb and the first finger, the handle pointing towards the letterer, allowing the three fingers to guide the hand along the edge of the **T**-square blade. The left hand is used to secure the square in position, either by holding it firmly at the head when working on a narrow sign, or at the end of the blade when working on a wide sign, which will prevent the square from slipping if the forefinger is rested against the bottom of the sign board as shown. By the use of the **T** square and this method of striping, the letterer can draw all vertical and angle lines, having first, by the same method, striped all horizontal lines, using a straightedge for this purpose instead of the **T** square, but maintaining the same position of the hand and brush. The block, half-block, and all straight-line letters of any style can be made with great rapidity in this manner.

POSITION OF HANDS.

17. The left hand should rest in an easy position, projecting the little finger, to steady it; this also gives a greater scope in making a stroke. The right hand should rest comfortably

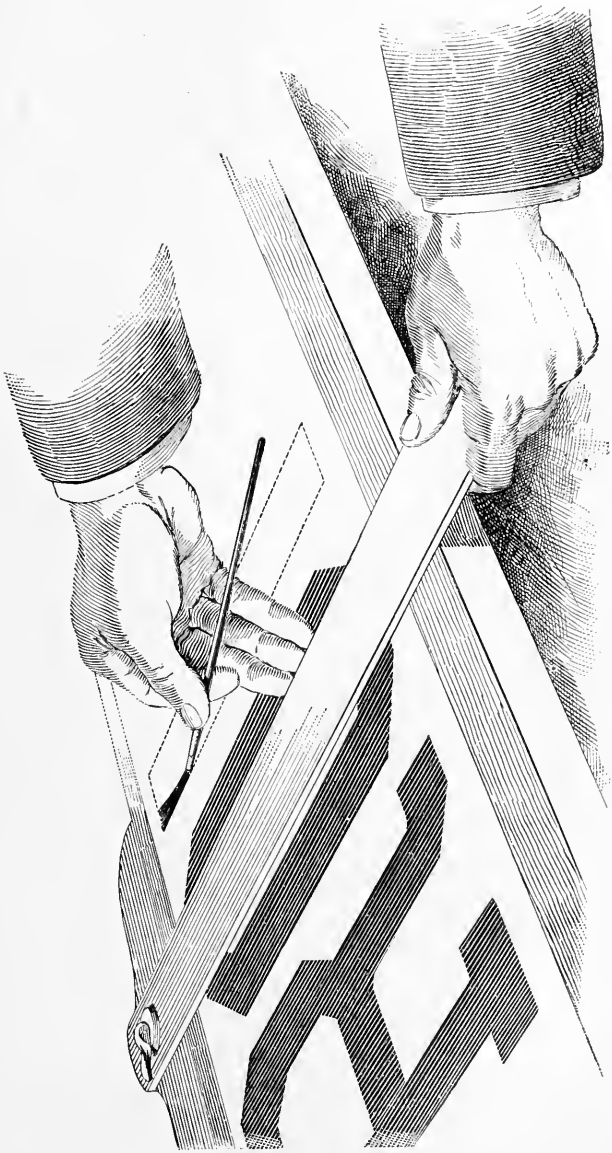


Fig. 1.

on the left, and be arranged in such a manner that the little finger of the right will come between the thumb and the forefinger of the left hand, holding the brush in the same position as in writing, as shown in Fig. 2.

18. Although this may seem somewhat awkward at first, it will be found, on practicing a little, that it is the most natural and comfortable position, as well as the one by which the best work can be accomplished. It allows perfect freedom of the hand in making all strokes of the letter, giving a greater scope in making large letters than any other position or method; it

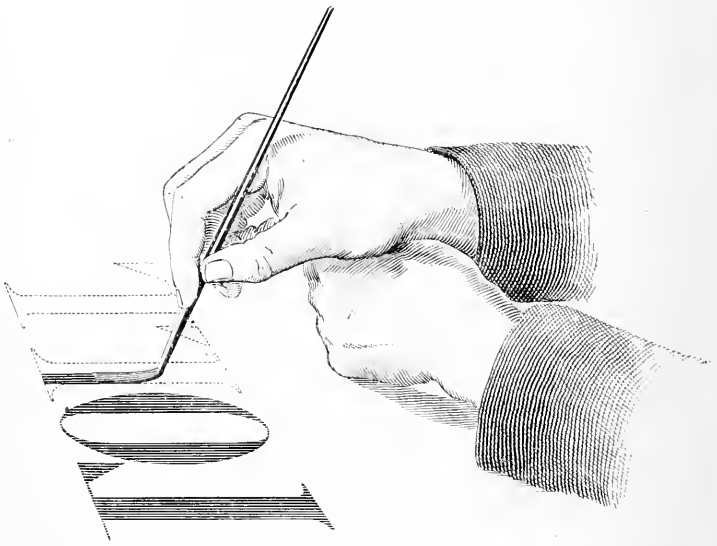


FIG. 2.

also forms a rest, giving the letterer entire control over his brush. By constant practice, a perfectly straight line may be drawn with the brush, either vertically or horizontally. When making letters under 1 inch in height, it is best to use but one hand in the position used while writing; and a red-sable brush, from No. 1 to 5, according to the size of letter, will be found to fill the requirements for small lettering.

STRIPING.

19. There are but two methods of striping with a brush, both of which are employed by the sign painter. The first of these, and the one most generally used, is shown in Fig. 1. By this method, the brush is drawn over the surface, spreading its hairs somewhat, and touching with almost the entire brush length, the letterer at the same time being careful to keep the width uniform. In some cases, when striping by this method,

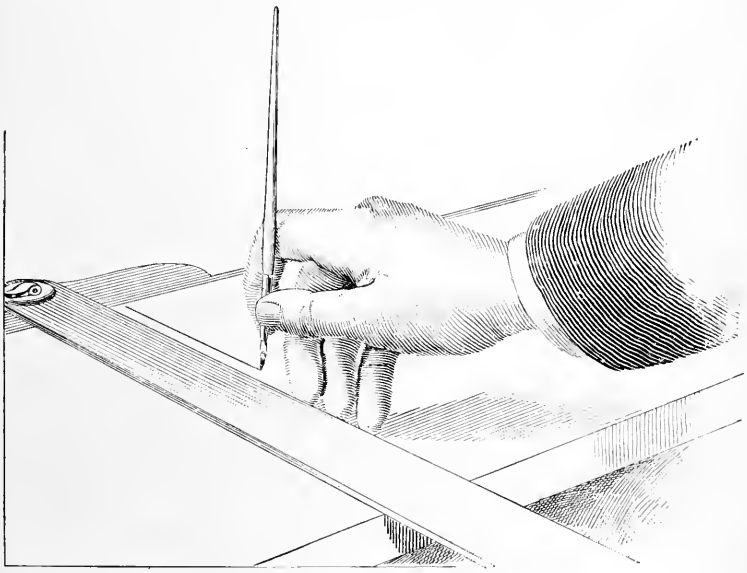


FIG. 3.

it is necessary only to observe the line made by the brush on one side, as in lettering or striping to the edge of the letter. This system the carriage painter uses exclusively, and for a brush he uses the one known as the *sword pencil*, a long flat brush with which he can make the stripe called the fine line, which is almost a hair line.

20. To accomplish the same results, the sign painter employs an entirely different method, producing equally as fine and perfect a stripe, but using the point of the lettering brush, or pencil, called also the *writer*, by holding the brush at

a right angle with the surface on which he is working, and allowing the fingers to guide the hand. The brush used for this method must be one that is either drawn to a slight chisel-shaped end, and turned edgewise to produce the finest line possible, or one that possesses a good point, which will not allow any of the hairs to spread while using.

21. Great care should be used in the selection of brushes for any class of work, either lettering or striping. Fig. 3 shows the other method of striping referred to. It will be good practice for the student to lay a straightedge on a sheet of cardboard, and draw the fine line, by observing the position shown in Fig. 3, until the perfectly straight hair line has been mastered. This will require considerable practice. Use the same brush, well filled with water or oil color, and practice the broad stripe by the method shown in Fig. 1. The brush for this purpose should be rather large, as a small one will not spread the color to the full width of the stripe desired. The effort to accomplish this by means of a brush that is too small will cause an irregular or wavy stripe; while the large brush will make the broad stripe with the hair in its normal position, and no great pressure, therefore, is required.

COLORS.

CLASSIFICATION OF COLORS.

22. The Primary, Secondary, and Neutral Colors. Colors are divided into three classes, namely: primary, secondary, and neutral. The semineutral, holding a place between the secondary and the neutral, is classed with the latter.

The primary colors are red, yellow, and blue. By a mixture of any two of these the secondary colors can be produced; and, by the addition of white and black in combination with the primary or secondary colors, all neutral colors, shades, and tints are produced. A combination of red and yellow produces the secondary orange. A combination of yellow and blue produces green. A combination of red and blue produces purple. The union of black and white produces lead color.

A combination of the three primary colors produces a *neutral* color, by using a proper quantity of each in proportion to its strength. A combination of the three primary in unequal proportions produces colors known as *tertiary* colors.

23. Color.—The trade term *color* always refers to any mixture that will produce each separate hue by compounding the primary and secondary colors; while the spectrum shades of the colors always refer to the blending of the primary and secondary colors, in the following order: red, orange, yellow, green, blue, indigo, and violet. These colors make twenty-one distinct shades.

24. Producing Shades.—The various shades of a color are formed by mixing a strong primary or secondary color with white, making several shades of different strength until the color has become indistinct, when it is termed a *tint*. A combination of red and green produces brown. Of this color there are many shades. The burnt and raw umber, and burnt and raw sienna, when in their natural, or raw, state are brown pigments, but, by chemical treatment, the burnt, or darker, shade of each is produced.

25. Semineutral Colors.—Brown, gray, and maroon, also the color produced by mixing blue and green neutrally, give rise to the other classification, called the *semineutral* colors. From the six principal colors come the great variety of colors into which each principal color is subdivided.

26. Warm and Cold Colors.—Colors are in harmony with each other when they partake of the same general effect, such as the chrome yellow and sienna, chrome yellow and umber, or such colors or tints partaking of the red or yellow, called *warm* colors, or those of the opposite nature, which partake of gray, lead color, green, blue, etc., producing colors or tints that are called *cold* in their effect or tone.

27. Contrast.—Colors are in contrast when warm and cold colors are used in connection with each other, although all such colors may not be so used without producing a heterogeneous effect, as certain shades of red and green, blue and green,

blue and red, etc. are most discordant to the eye when placed close together. Coloring, therefore, is a study that can be accomplished only by close observation and experiment. Just as the professional musician produces some combined sounds that thrill us, so the professional colorist produces effects that are beyond the comprehension of the unskilled. More particularly is this true of the coloring displayed by the artist that imitates nature. He may, by the art of coloring, not only deceive the eye but produce combinations that will be most pleasing to it.

HANDLING OF COLORS.

HARMONY AND CONTRAST.

28. Scope of Subject.—The handling of colors, in the full sense of the word, does not mean simply the knowledge of the many ways colors can best be applied to a surface, but involves a knowledge of the nature of the colors themselves, the effect of the elements on each, and the relation they bear to one another. This relation in colors classifies them as either harmonizing or contrasting with one another. A colorist should understand the result and drying effects of placing one mixture on another, each having as a base an entirely different medium or liquid. All of these details must be considered by the painter, and many annoyances and serious complications can be avoided by bearing in mind the following important instructions.

29. The Drying Qualities of Colors.—Colors mixed with slow-drying liquids, such as oils or varnishes, can be covered with a coat of the same color, when the first is dry, even though quite tacky. But to cover this surface, if not perfectly dry, with a color mixed with some quick-drying japan or varnish, will produce a crackled, pebbled, or uneven surface when it does dry. One color should be perfectly dry, therefore, before another is applied. The same result will be produced should a slow-drying color be placed over a quick, if the first coat is not perfectly dry before the second is applied. This can easily be understood, as the quick color possesses a

contracting or shrinking character in drying, while the slow color, mixed with oil or varnish, is of a flowing or expanding nature. As the under color continues to dry out after being covered over, its contraction causes the result described above.

30. Durability.—Colors mixed with the best coach varnish will stand longer when exposed to the weather than when mixed with any other material, and raw or boiled linseed oil stands next in value for the same purpose; but japan or turpentine as a mixture will produce colors with little durability. English vermilion is a color that cannot be used for outside purposes with any assurance of its remaining long or holding its original brilliancy. This color is a pigment of mercury and sulphur, and when exposed to the elements bleaches out to a dull pink, about the strength of flesh color. The American, or aniline, vermilion is one of the many products of coal tar, and its effect is directly opposite to the English vermilion, for after exposure to the elements this vermilion turns a very dark brown. These effects may be somewhat compensated by mixing the two together in relative proportions to render them neutral, but at best the color is not one to be used freely for outside work.

31. Lampblack will outwear all colors. It is often seen on signs that have stood many years of exposure, where the black has remained with a good surface, while the three or four coats of ground color have entirely disappeared, together with portions of the weather-beaten wood, giving the sign an embossed appearance. Blues as a rule are not lasting, while all other colors may be considered of about equal durability.

GROUND FINISHES.

SMALTING.

32. Preparation.—Smalting consists of covering over a freshly painted surface with fine sand that has been dyed a suitable color. This process, though simple, is of the greatest importance to the sign painter, as he can thereby produce a ground that gives a most finished appearance to his work,

causing rough or uneven sign boards to present a smooth surface. The success of smalting depends largely on the color upon which the smalt is to be placed. This color is called the "cutting-in color," and should always be mixed fresh and prepared as follows: The best refined lampblack is mixed with boiled linseed oil, and ground on a marble or plate-glass table, with a palette knife, until all lumps and specks have disappeared. The mixture should be thick enough to grind easily, and not flow or spread out on the table surface. To each half cup of color, add a lump of white lead equal in size to an English walnut, and add to this equal parts of boiled oil and coach japan, so as to give the mixture a consistency that will allow it to flow freely from the brush, but still retain a good body. This mixture can be used for black, blue, or dark-green smalt without changing. For brown smalt, twice the quantity of white lead should be added, colored strongly with Indian red. For light-green smalt, green or yellow should be used in place of Indian red.

33. Method of Application.—After the letters are cut in on the sign, this color is spread evenly over the ground, care being exercised not to allow any ridges of color to form at the edge of the brush. A small pencil brush can be used to cut in the letters, no matter how large they may be, and a flat soft brush is afterwards used for filling in the background, the latter varying in size according to the sign. After the sign is filled in, strips of Manila paper or enamel cloth are spread on the table or floor, and the sign is so laid over them that one edge is on the paper or cloth. The smalt is then sifted on evenly over the entire surface through a small-mesh wire sieve. After remaining a few moments, all the surplus smalt is removed by tipping the sign edgewise and shaking the smalt on the paper.

Black smalt is used more than any other color, but is more likely to show defects. The use of smalt that has been kept in a damp place for some time without first drying thoroughly, will cause streaks of gray to appear in the finished sign, for which there is no remedy. In smalting, care should always be

exercised not to cover the sign thickly enough to break the edge of the letter by its weight, when the surplus is tipped or thrown off.

The edge or band of a smalted sign should invariably be painted with colors mixed with varnish, giving a glossy finish to it. Black is usually used for this purpose, especially on signs smalted with black or dark blue.

34. Flock.—On signs exposed to the weather, smalt is the only material that can be used for this purpose. For inside signs, however, a material known as "flock" is used; this is a ground cloth that can be obtained in several colors, although the maroon and black are most commonly used. Flock is applied to signs in the same manner as smalt, but the cutting-in color on which the maroon is placed must be made to match the color of the flock as nearly as possible.

VARIEGATED GROUNDS.

35. Variegated grounds are often used on large advertising signs, as well as on many kinds of stenciled signs. The color of the background when the sign is finished must govern the selection of the variegating colors. If the ground when finished is to be blue, cream and lemon tints, with possibly a touch of sienna or orange, may be used. If the ground is to be black, two or three shades of green, or, in fact, almost any color can be used. A maroon ground, with a variegated blue letter, makes a most pleasing combination.

36. Two coats of white lead are applied to the ground before the variegating colors are applied, and then three colors are laid on lengthwise of the line to be lettered, giving equal surface to each color. The top is white, the bottom is a medium shade of the variegating color, and the intermediate shade is placed between these, and is then blended where the colors come together, beginning with the lightest. When the sign is "cut in" and finished, each letter will appear as though it were shaded separately.

PREPARATION OF SURFACES.

37. Foundation Work.—There are many kinds of surfaces to be dealt with in lettering, for the letterer may be called on to place letters upon any solid material known. A sign board when first turned over to the sign painter from the sign carpenter may possess solid knots or streaks of pitch, either of which will show through many coats of color unless their penetrating quality is destroyed. This is done with orange shellac, applied after the board has been thoroughly dusted off. When the shellac is dry, the sign is ready for the first coat of paint, called the *priming* coat. This must invariably be white lead mixed with boiled linseed oil only. When this has been dried and the board has been run over lightly with sandpaper and dusted, all nail holes or other defects are filled with putty, after which the second coat is applied, and should be mixed with one-fourth turpentine to three-fourths boiled oil. This coat is sandpapered also, and the third, or finishing, coat is then applied, which is a mixture quite reversed from that used for the second coat. The third coat should consist of about two-thirds turpentine to one-third boiled oil, and will insure a flat- or dull-finished surface to work on.

38. Defects.—A glossy surface might cause trouble, if allowed to stand some time before being lettered, as the placing of one oil color upon another is liable to cause the second one to creep, that is, to leave the ground surface, causing large or small pitted spots to appear. This may be avoided by rubbing the surface with curled hair, or with pumice stone and water, or by dusting a small quantity of whiting over it. White enameled oilcloth is used extensively for lettering purposes; to insure against the above difficulty, benzine or turpentine should be rubbed on the surface with cotton cloth or batting.

39. French Enamel White Finish.—If a French enamel white finish is desired, the sign should be painted evenly with two coats as above, but the third coat should be of white "rough stuff," applied as paint. This should be rubbed down to a smooth surface with white pumice stone and water

the day following its application. Three coats of rough stuff are necessary, one each day, repeating the rubbing process after each. For finishing this surface, equal parts of Florence and zinc white are mixed in special light rubbing varnish, prepared especially for white. One coat of this mixture is applied, and the day following is again rubbed with the ground pumice. If not evenly covered, a second coat of the zinc and Florence white is necessary and also another rubbing, after which one coat of light English finishing varnish, colored well with the zinc and Florence white, is flowed on, enough only of the white being used to change the color of the varnish, but not enough to make it a solid color.

40. Carriage- or Piano-Body Finish.—To make a carriage- or piano-body finish, the sign is painted with two coats of lead, as previously directed, adding black enough to produce a lead color, after which the surface is given a coat of ordinary "*rough stuff*" the following day. After this has remained twenty-four hours it is rubbed with *lump pumice* and water. To insure a perfect surface, at least four coats of rough stuff should be applied (one each day), after which the sign is ready for the finishing coats. If a black finish is desired, the surface is given a coat of coach black ground in japan. This is followed with two coats of rubbing varnish, colored well with black, each coat being rubbed with ground pumice and water (using the curled hair for the rubbing). One coat of best coach finishing varnish is then flowed on in a room of high temperature and free from dust or draft. When the sign is dry, it possesses the finest finish possible to produce, if the work has been properly done. Should any color other than black be desired, the color may be substituted in place of the black on the first coat after the rough stuff, and rubbing varnish should be colored accordingly. This process can be used on all sheet-metal or iron surfaces, on which the roughness may be overcome by filling well with a putty made of white lead and whiting laid on with a wide-blade putty knife.

41. Frosting on Glass.—This is a process by which lettering is made to show in a conspicuous manner, and also

serves the purpose of a door transparency, or it is often placed on windows opening into a hall or area. By the use of sour beer and Epsom salt, a frosting may be produced that closely resembles the fantastic marking of the natural frost on the window pane; but the frosting usually applied by the sign painter is produced by the use of sugar of lead (in tube) or white lead. The former, having less body (or substance), is made to imitate more closely the frosting produced by the *sand-blast process*, and is applied with a brush as thin and evenly as possible, and stippled with a brush made especially for this purpose, or with a pad of unsized cotton cloth filled with cotton batting. White lead used for this purpose should be mixed with 2 parts boiled oil to 1 part turpentine, and applied in the same way as sugar of lead. When it is desired to show the lettering most prominently, the white lead is used, it being when applied opaque, and much whiter than sugar of lead.

SIZES FOR GILDING.

GILDING WATER.

42. In the preparation of size for gilding on glass, the greatest care must be observed to avoid the existence of the smallest particle of oil in the vessel in which it is made. In fact, the most scrupulous cleanliness is necessary throughout the preparation of the size, as the faintest trace of any foreign matter will materially injure the gilding.

Size for glass gilding is prepared by dissolving, in a pint of pure water, a piece of Russian isinglass about the size of a silver dime. The vessel containing the water is then placed over a gas stove, coal fire, or other device that will heat it rapidly to the boiling point. After boiling about thirty seconds it is removed from the fire, and allowed to cool; it should then be strained through a perfectly clean piece of muslin, after which it is ready for use. This gilding water or size must be prepared fresh every day, as it is practically useless after twenty-four hours, and should always be made with distilled, rain, or melted-ice water, the first being preferred.

SIZE FOR OIL GILDING.

43. Sizes for gilding on wood or metal are of two kinds, known as *slow* size and *quick* size. The former is used when the sign or surface to be gilded is large, and will require considerable time to complete the gilding; while the latter is used on small zinc or japanned iron signs, where the letters are small and the entire gilding can be completed in from one to five hours.

44. Slow Size.—Slow size is made from boiled linseed oil. The oil is allowed to stand in a warm place until it is of about the consistency of molasses, and is then called *fat oil.* Equal quantities of fresh boiled oil and coachmakers' japan are mixed together; this mixture and the fat oil are then united in equal proportions, together with a sufficient quantity of chrome yellow to render it easily seen during its application to the surface to be gilded. These, when thoroughly stirred together, will form a size that will stand from fifteen to twenty-four hours. The drying qualities of the slow size are influenced by the temperature in which it is allowed to stand.

45. Use of Slow Size.—In using this slow size, it must not be allowed to flow thickly over the surface, but should be brushed out evenly to cover the entire surface, to which it is applied to an even depth. If one part is more thickly coated than another, it will not dry to the surface of the sign, and will afterward break through the gilding when the surplus gold leaf is being removed, or when the gold is burnished. This size will keep ready for use for a long period if placed in a corked bottle or tightly capped jar.

46. Quick Size.—Quick size is made in several ways, according to the length of time required for it to dry. This is of course governed largely by the amount of work ahead of the letterer to be gilded. About 30 drops of boiled oil added to $\frac{1}{2}$ ounce of Hedden & Wheeler's japan gold size will prepare a size that will dry in about two hours. This can be made quicker drying by reducing the quantity of oil. But to add oil in excess of the quantity prescribed above will produce an

unreliable mixture, so that another preparation is necessary for slower size. The above size should be colored with a little orange or lemon chrome yellow, well mixed together on a glass surface by the use of a palette knife.

47. A Medium-Slow Size.—Another size that will stand longer than the above is prepared by stirring, in ½ ounce of coach finishing varnish, about 30 drops of coachmakers' japan. This will stand four or five hours. In all work of importance it is advisable to test the size upon a piece of the material to be gilded, in order that the length of time it will stand may be accurately known. Different surfaces require different sizes. Some work requires a size that will stand for twenty-four hours, while on another material it should be ready to gild in three hours or sooner. The reason for this is that slow size cannot be made to produce an even or sharp edge on smooth surfaces. This size may be preserved in a tight jar in the same manner as the one previously described, though it has a much stronger tendency to become thickened. Better work can be produced with quick size, freshly prepared, as it not only flows from the brush more freely, but is also more reliable in drying. Either of the foregoing quick sizes may be thinned, if necessary, with a little turpentine, but too much turpentine will destroy the luster of the gold.

48. Proper Materials Necessary.—It will be observed, by one familiar with the action of the elements on certain colors, that size used for signs on the exterior of buildings will show the effect of the elements very soon after its exposure to the weather, if it has been improperly prepared. A common mistake is the use of yellow size for aluminum leaf or bronze, which is likely to show through the face of this metal. Size for such materials should be made with about 2 ounces of light coach varnish, to which is added a piece of pure white lead as large as an English walnut, and about a spoonful of japan gold size and the same quantity of turpentine. The leaf or bronze should be applied while the size holds a strong tacky surface, and is just dry enough so that bronze will not show an uneven surface when applied. The bronze must always be put

on the surface in large quantities, with a chamois-skin pad filled with cotton. If used too sparingly, the surface will present a clouded appearance, which cannot be overcome or remedied.

49. The size for gold bronze should be the same as that used for gold leaf, but colored with lemon chrome yellow. For copper bronze, use orange chrome, darkened with a little Indian red, which produces a color resembling somewhat the copper bronze.

GILDING.

GILDING ON GLASS.

50. Gold Leaf.—The gold leaf used for this purpose should be of the best quality. The gold beater usually prepares two grades of leaf; that used for this purpose is not beaten as thin as the ordinary leaf used on wood. The thin leaf will break easily in the process of laying on glass, not only causing considerable annoyance, but also involving extra expense. It is therefore desirable that the leaf made especially for this purpose should be obtained direct from the manufacturer.

51. Tools and Materials Necessary.—To lay gold leaf on glass several things are necessary: *first*, the tip, which is a long-hair brush, capable of holding a full-sized leaf of gold; *second*, the gilding brush, which is a soft camel's-hair brush, about $1\frac{1}{2}$ inches wide; and *third*, a handful of soft well-carded cotton batting for rubbing the gold. The tip will not pick up the leaf from the book unless prepared first to do so. This is done by drawing the tip across the head, at the same time pressing the hair of the tip so as to allow some of the natural oil of the human hair to adhere to it. Gold leaf being extremely sensitive to the touch, the most trifling amount of adhesive is all that is necessary, as too much will give rise to serious trouble by causing the leaf to adhere to the tip too persistently, or by the oil coming in contact with the surface of the glass, and destroying the luster of the gold, or even by

preventing it from adhering to the glass at all. Gold leaf is very frail material to handle, and therefore great caution is necessary in its application.

52. Method of Procedure.—The design or inscription to be gilded is placed on the reverse side of the glass by means of a perforated pattern, through which whiting is pounced, thus showing the outline of the letters or parts to be gilded; or the design may be marked out with ordinary white chalk or the lithographer's black crayon pencil, which will readily leave a mark on a glass surface. The surface on which the gilding is to be done must be perfectly cleaned by removing all possibility of oil or even finger marks. The book of gold leaf is laid on a flat surface, with the opening toward the right. One leaf of the book is folded back and creased with the left hand, thus exposing the gold. The cutting of the leaf is then accomplished with the little-finger nail of the right hand, by running the nail along on the gold, using the folded book leaf for a guide. The piece of gold so cut is picked up with the tip (which is held in the hand during the cutting process) and laid on the glass lightly, after having first covered the part to receive the gold with a copious coat of the size, the preparation of which is treated under heading "Gilding Water." The brush used in the size is usually a 1½-inch flat camel's-hair. All letters should be covered with a liberal supply of gold leaf, allowing it to overlap the marking. When the size under the gold is perfectly dry, the surface should be well rubbed with cotton batting, which will remove all scrap leaf that has not adhered or that has overlapped, and will expose to view any spaces or parts that have not been properly covered. The size is then flowed all over the work (beginning at the bottom), and gold is laid on all spaces that have not been previously covered. When this is dry, a second rubbing with the cotton will remove the surplus. A third or fourth washing of size does no harm to the gold, and when diluted with warm water, produces a brilliant burnished effect.

53. Sheet-Glass Signs.—If gilding has been done on a sheet of glass to be used for a framed sign, the pattern must

again be pounced with whiting over the gold leaf, which furnishes a guide, showing the place occupied by the letters. To prepare a paint to letter over gold leaf on a window that is exposed to frost (the great enemy of window gilding), a slow-drying varnish, colored well with lemon or orange chrome yellow, should be used, and when dry the gold leaf extending beyond the letters can be cleaned off easily with water, a little whiting, and cotton batting. For a backing or lettering color for framed glass signs, a quick-drying varnish or asphaltum black can be used. As these signs are not exposed to the elements, almost any color can be used on them. A color is preferable, however, that is made the shade of the gold leaf, and that will not be seen when the sign is finished, should any small cracks or spots have been left in the gilding that would be considered too small to regild.

GILDING ON WOOD OR METAL.

54. Method of Procedure.—Having considered the use of the tip and handling of gold leaf for gilding on glass, we will now consider its application to a wood or metal surface.

The manner in which the gold is laid on these materials differs. The slow size will allow us to cover the whole sign with gold leaf, before rubbing down to a burnished surface; and, if the letters are large enough to take the whole leaf without much waste, the letters can be gilded from the book without the use of the tip, by turning the leaf back and placing the book face downwards on the size, rolling the leaf on gradually, so as not to break it. When the sign is entirely covered, a 2-inch bear's-hair brush is used to remove the surplus, and the whole gilded surface is well rubbed. This will take the superfluous scrap, carrying it along the letters, filling in all cracks or small spots that may have been overlooked, and, if these are not too large, will not show when the gold is burnished. After rubbing with the brush, a handful of cotton batting should be used, and the gold rubbed with this until no laps or spots are seen.

55. Gilding on Quick Size.—To gild on quick size, gild the first two letters rapidly, rubbing down the first letter only;

proceed immediately to gild the third, afterwards rubbing down the second, and so on until the sign is gilded. The reason for doing this is that, if the gold were allowed to remain too long on quick size before burnishing, it would have a wrinkled appearance, caused by the action of the size while drying, and thereby drawing the gold, which is prevented when the surface is covered evenly with gold and burnished. Aluminum leaf, which is considerably tougher than gold leaf, can be applied on several letters before burnishing.

56. Outside Gilding.—For outside gilding, or gilding in places where the wind is strong enough to prevent both the use of the tip and the process of gilding from the book, another method is followed. This is accomplished by cutting wax paper in sheets large enough to leave a margin of $\frac{1}{2}$ inch beyond the edge of the gold leaf, which is applied to the wax paper by carefully laying the wax paper on it and pressing it evenly. The waxed gold leaf is then placed in an empty book and is ready for use. The size being more tacky than the wax surface of the paper, the leaf of gold will leave the paper and adhere to the size by pressing the waxed leaf with the hand. After the letters have been entirely covered, they should be rubbed down as described, using the bear's-hair rubbing brush and cotton batting, as in other gilding.

PEARL FILLING AND ETRUSCAN GILDING.

57. Pearl Filling.—The pearl filling often seen in the most elaborate window lettering is not in such general use today as in former years, as it has been supplanted somewhat by the Etruscan gilding, which consists of a dull or chased filling within an outline of bright gold. The material used for pearl filling must be the best quality mother of pearl in perfectly flat and thin pieces, and applied after the letters are gilded, shaded, and otherwise finished. The open strokes of the letters are coated with a light-colored coach varnish (to which a few drops of japan gold size have been added), overlapping the edge of the strokes, but without covering the shade,

especially if the shade is of semitransparent colors. The varnish is then allowed to stand a few moments until it will take the pearl without danger of slipping. The pieces are then fitted to fill the space within the letters as nearly as possible. After one letter is covered, and before beginning on another, well-crumpled tin-foil is taken and covered over the entire back of the letters, and is pressed in well with the fingers, so as to force the foil in contact with the varnished surface of the glass. Do not finish more than one or two letters at a time, unless, however, there is positive surety of the drying qualities of the varnish. The tin-foil filling gives the appearance of a solid pearl letter.

58. Etruscan Gilding.—The Etruscan gilding produces a chased-gold or silver effect, and is accomplished by a simpler method than the foregoing. There have been many kinds of size suggested for this purpose, but the one producing the best results is sour beer, although either glucose water that has been allowed to stand some time, or a few drops of turpentine in ordinary gilding water may be used. The beer size is applied in the same manner as regular gilding water size, but the gilding must not be rubbed with cotton. To cover all places that may have been left in the first gilding, the part already gilded is covered with a second application of the beer size after the former has thoroughly dried, and any open spaces are then gilded over. When dry, this should be painted over with a varnish color, somewhat of the same shade as the gold.

59. Finishing Coat.—All lettering on glass should be well backed with a varnish color as a finishing coat, both to protect it from frost and from the wear caused by cleaning the glass. It is impossible to protect lettering on glass from eventually peeling off, especially when certain conditions obtain; but with extra caution, window-glass lettering may be made to stand for years. A coat of best coach varnish, overlapping the edge of the letters about $\frac{1}{16}$ of an inch on the clear glass, will prevent frost from penetrating underneath the edge of the letters, and thus hastening their tendency to peel.

EMBOSSING.

EMBOSSING ON BRASS PLATES.

60. Importance.—This work requires a greater amount of caution than any other branch of sign painting. Not only are the materials expensive and mistakes costly, but the chemicals with which the work is done are dangerous, and any improper use of them would be likely to impair the health or even destroy the eyes of the operator. Embossing on brass includes not only the preparation of the plate, but the etching and finishing of the brass. The best grade of engraving brass is required for this process, and gauge No. 16 is the thickness in most frequent use. This is $\frac{1}{16}$ of an inch thick. The plate must be well buffed before lettering. The design should be made on medium-thick Manila pattern paper, and transferred to the brass plate by means of carbon transfer paper. After the design is transferred on to the plate, it is ready to cut in, preparatory to the etching process.

61. Material Used for Resisting Acid.—Asphaltum black is used to protect the plate while in the acid bath, and must be applied with an even, solid surface, and not thinned more than is absolutely necessary. Use only the best quality of asphaltum, and thin with equal parts of coachmakers' japan and coach finishing varnish. The letters and other designs are cut in with this color, leaving the letter and stripes clear. The entire sign is then covered evenly to the edge, and allowed to dry twenty-four hours at least. The marks made by the tracing should then be removed with water. A new cotton cloth is then used to rub the entire surface, which is done to destroy the glossy surface of the first coat, in order that the second may be seen, after which a second coat of the asphaltum is applied with care, to keep as close to the edge of the first one as possible. The second coat is allowed to stand forty-eight hours, after which the sign is ready for the etching bath.

A coating of beeswax is also used as a resist, and is applied to the brass, silver, or white-metal plate when hot. When this material is used, the design is traced through it on the surface

of the metal by means of a stylus. The wax is used only when a line etching is desired, and is therefore more especially adapted to small work, on which the letters are of miniature size.

62. Etching.—The etching should be done in a room set apart for this exclusive purpose, as the fumes and gases given off during the process are extremely unwholesome, and in fact very poisonous, and should never be inhaled. The sign to be etched is laid on a table, the top of which has been rendered

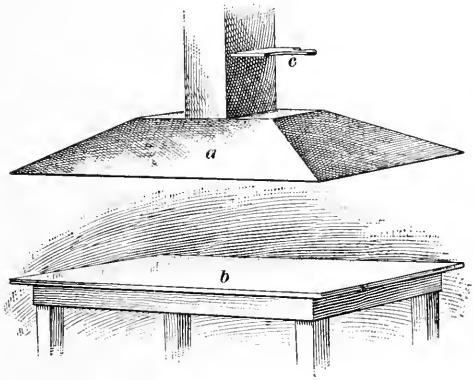


Fig. 4.

perfectly level, and over it is suspended a funnel-shaped hood, to collect the fumes and carry them off to the outside air or to a chimney flue. This arrangement is shown in Fig. 4, where *b* is the etching table under the hood *a*. At *c* is shown the vent that carries off the obnoxious vapors.

63. Beeswax Dam.—The sign is now prepared by banking up the edges with beeswax, all around the four sides, so as to give it the form of a shallow tray. The beeswax is prepared by melting together over a slow fire $\frac{1}{2}$ pound of beeswax and $\frac{1}{2}$ pound of rosin, and adding about 3 fluid ounces of boiled oil. When thoroughly melted, this mixture is poured into a vessel of cold water, and is then ready for use. Should the mixture become too hard, by standing, to work easily (it should be about the consistency of putty), it may be remelted and a little more oil added.

64. Use of the Acids.—Within the rim of wax, and over the entire surface of the sign, a mixture of 1 part nitric acid to 2 parts water is now poured to a depth of about $\frac{1}{4}$ inch. The liquid will immediately begin to effervesce, and strong pungent fumes of a yellowish color will rise from the surface. The hood should now be adjusted to receive and carry off these fumes, and the action of the acid be permitted to continue until the letters are "eaten into" the plate about $\frac{1}{32}$ to $\frac{1}{24}$ of an inch, according to the depth desired. The depth of the letters may be determined by feeling their edges with a pointed tool of any kind, though care must be exercised not to scratch the asphalt surface.

Should the action of the fluid for any reason be too slow, it may be hastened by pouring a small quantity of the pure acid on the surface of the plate, and stirring it around carefully with a whisk broom, or, if too strong, the acid may be diluted with water. Strong acid has a tendency to undercut the letters and destroy the sharpness of their edges. The etching, therefore, should not be done too quickly, for it should take three or four hours for the acid to eat the brass to a proper depth.

65. Cleaning the Plate.—After the etching is complete, the plate is removed from the table, the acid is poured off (by breaking a small piece of the wax dam out of the end), and the whole plate thoroughly washed in cold water. The bath tray, previously prepared, is usually built of wood; it should be large enough to receive the entire plate, and deep enough to hold 3 or 4 inches of water. The wax is then removed from the edges and saved for future use, and the asphalt coating wiped off after it has been thoroughly softened with turpentine. Should there be any slight imperfections in the surface of the plate, due to the action of the acid through an exposed place in the asphaltum, they can easily be removed (if they are not more than surface marks) on an ordinary buffing machine.

66. Filling.—The etched letters are usually filled with black japan, which is afterward baked until it has the appearance of a vitreous mixture. This, however, is a separate business, and outside the province of the letterer. The etched letters are

sometimes filled by the letterer with gutta percha or a black made with patent dryer, though the results are not as good as with the other material. Gutta-percha filling is made and applied as follows: Take equal parts gutta percha and asphaltum, and melt together in an iron pot, with about one-quarter their bulk of finely powdered gum shellac, and while the mixture is still hot it is penciled in the letters. Should a red or blue filling be required, the asphaltum can be replaced with vermilion or cobalt blue, according to the one required.

EMBOSSING ON GLASS.

67. Bifluoric Acid. — The preliminary details and arrangements for embossing on glass are precisely the same as previously described for etching brass, with the exception of the acid. Bifluoric acid is an intensely corrosive compound that will dissolve every glassy substance it comes in contact with. It is usually put up in lead or rubber flasks, and can be purchased only in the original packages. For use, the acid is diluted to the proportion of 2 parts acid to 3 parts water, though, if this is not strong enough, the proportion of acid may be increased. If the etching fluid is too strong, the edges of the letter will be undercut and the plate destroyed. The object of glass embossing in lettering is to show a richness in gilding by contrast. This is accomplished by gilding the etched letter and surrounding the edge so as to show an outline of bright gold. The gilding on the etched center of the letter is mottled, and shows the thickness of the etching, presenting a decidedly rich effect, especially when designs are executed with the pencil brush within the outline of the letter.

68. Testing the Acid.—The strength of the acid may be tested, in order to know when the sign is etched to a proper depth, by the use of the same sharp tool as before, which must be used with great care, however, as a slight scratch on the edge of the letter or surface of asphaltum would show the effect of the acid after the sign is finished. It is not necessary that etching on glass should be of greater depth than will show the

edge of the letter and produce the mottled effect. This acid is removed in the same manner as the nitric acid, and the asphaltum dissolved with turpentine, after which the plate is well cleaned with whiting and water, and the embossed glass sign is ready for the finishing process, or the gilding and coloring.

It is always desirable that the best results may be obtained; and, to insure this, the time should not be considered lost in testing the strength of the acid on various glass surfaces. Plate glass offers less resistance to the acid than sheet or crown glass. The acid is influenced, therefore, by the metallic oxide contained in the glass.

LETTER SHADING.

COLORS USED.

69. Combinations in Shading. — There is a great variety of methods by which the shading may be added to a letter by the use of colors. A law exists in nature that is very forcibly shown in combining colors when shading, and this must be regarded, or the work will not produce satisfactory results. A color apparently of a suitable shade when mixing, if placed on a *black* ground, will appear many shades lighter; and the reverse is likewise true. If the same color be placed on a *white* ground, it appears many shades darker. Letter shading may consist of several shades of one color, or several distinct colors may be used together, either blended or separated by outline.

70. Transparent Shading.—This method is of service to the letterer, in that it both saves time and gives most satisfactory results. A transparent shading mixture is made by stirring a few drops of well-ground black in a medium-drying varnish, adding also a few drops of turpentine. This mixture forms a shade for all light colors and tints, and, if properly applied, produces what is known as the *natural shade*, or the same strength and shade as would be cast from a projected object on the same ground.

71. Glaze Shading.—Transparent shade is used in the form of a glaze shade on such colors as vermilion, green, blue, yellow, etc. by adding a color corresponding with that with which it is combined. For example, the glaze shade applied on vermilion should be mixed with carmine (in tube). For green or blue, Prussian or some other strong blue is used, and sienna on yellow, etc. The glaze shade is always placed on another shade when the latter is thoroughly dry, and covers one-half of this nearest the letter, as shown in Fig. 5 at *c* and *e*.

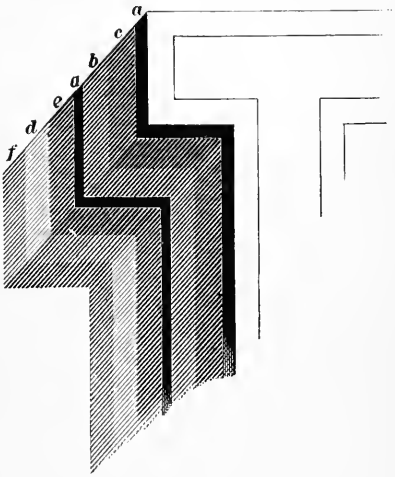


FIG. 5.

72. The Double Shade.—This is also illustrated in Fig. 5, in which *a* shows the black line used to divide the shades; *b* shows the block, usually some bright color, as vermilion, blue, etc., on which the glaze shade *c* is placed; *d* and *e* represent some neutral color, as gray, brown, etc., of which *e* is the transparent shade; while *f* is the natural shade on the ground color, made with the same as *e*, but giving an entirely different shade.

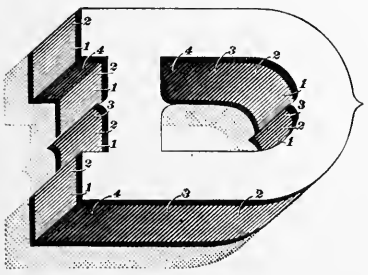


FIG. 6.

73. The Spectrum Shade.—This is produced by blending shades together, and its use is confined almost exclusively to the gilded and silvered letters on glass, although the same colors cannot be used on both. The natural color of the gold is warm, and therefore harmonizes with almost every color; while the silver

is cold in tone, and suitable colors to combine with it must therefore be selected. Five colors are usually blended, when vermilion is used for the spectrum shade, as follows: (1) cream; (2) lemon yellow; (3) orange; (4) vermilion; (5) carmine. In all other cases, four shades of one color are used. In Fig. 6 is shown the proper position the four shades should occupy. It will be observed that the darkest shade *4* comes against *1* the lightest which is usually a tint of the color, while *2* and *3* are equally divided in strength between these extremes. The shades always occupy the same relative position shown, except on letters having a horizontal stroke, in which case but two colors, *3* and *4*, are used underneath these strokes.

THE PREPARATION OF COLORS.

APPLICATION TO VARIOUS MATERIALS.

74. Proper Use of Mixtures.—Much rapidity is gained in lettering by a knowledge of the color, or combination of colors, that can be used to the best advantage on a particular material. Suppose, for example, we have an elaborate silk banner on which a design is to be executed; unless the proper mixture were used, the oil or other medium would be absorbed by the silk and so spread as to ruin the material at once. This condition may arise in the use of colors and their application to the many materials, where a successful design will depend on the kind of mixture used.

75. Lettering on Cotton Sheeting.—Cotton sheeting must be wet before being lettered, and while quite damp the lettering may be applied. Color for this purpose can be mixed with equal parts of boiled oil and japan, and thinned with turpentine. A 1-inch flat varnish brush will be found convenient in order to spread the color on the cloth with great rapidity, if the letters are large; and for small letters the camel's-hair swan quill is used. Shading colors thinned well with turpentine can, without danger of spreading, be applied when the cloth is almost dry.

76. Cardboard and Enamel Cloth.—Cardboard must always be lettered with water color or card black. Enamel cloth will also take this latter color, and it will be found to be the only color that can be used on this material with absolute certainty that it will not creep.

77. Silk.—On silk, different preparations must be used under different circumstances; for instance, if the design is in the form of a large panel on which a picture is to be painted, a paint must be used that will render the material pliable. An outline of hard-drying color may be used, and the center of the design filled in with any oil color to which has been added melted beeswax to the amount of one-fifth of the color. Ordinary orange shellac is used for a lettering preparation, and will be found a very reliable one. The shellec is used clear, but not too thin, though when too thick to flow easily from the brush it may be diluted with alcohol. Letters on silk must have two or three coats of this, according to the grain of the material, before it is ready to size for gilding, otherwise the size will not bear out, and the gold will appear mottled. Another preparation for the same purpose is the clear asphaltum, which should be thinned out with gold-size, japan, and a few drops of turpentine; this will be found much better to use on close-grained silk than the shellac. All shading colors used on silk or satin should be mixed with naphtha to prevent them from spreading.

78. Black-Surface Cardboard.—On black-surface cardboard, the white used for lettering should be water color, which can be mixed by filling a tumbler two-thirds full of zinc white, and adding enough water to dissolve it, and, when well mixed, about a tablespoonful of mucilage. This should be well stirred and allowed to stand a day or so before using, then thinned to flowing consistency and kept in an air-tight jar. Either Florentine white or Krenmitz white (unsized) will be found to be an excellent color also, but these must be mixed with a little mucilage to keep the color from rubbing when dry.

79. Glass.—For glass, the color used mostly is black, epecially for outlining, shading, and lettering. To mix this color, use dry lampblack, best quality, grind thoroughly with a palette knife, and add only best coach varnish. Thin with equal parts of coach varnish and turpentine. Dry colors mixed with water and glue are used for temporary lettering on window glass. Many beautiful effects are produced by their use, as they flow freely and dry quickly.

80. Brick or Stone Panels.—For lettering on brick or stone panels, the white lead should be mixed with nothing but boiled oil. The black used is lampblack of an inferior grade, as it will answer for this purpose as well as the best quality. Mix the lampblack, boiled oil, and a cupful of japan to a gallon of color.

81. Plastered Surfaces.—For lettering on plastered surfaces, a light flowing color, such as the card black, will cover the surface and will not spread or run. If colors are desired, mix them thick with coach varnish, and thin freely with turpentine. These colors will dry flat (or without a gloss). If oil colors were used on this surface, the oil would flow from the color into the white plaster and show a yellow line surrounding the letter. The nature of the mediums, regarding their drying qualities and the application of colors, is therefore a constant study with the sign painter, and requires his careful consideration.

RELIEF LETTERS.

WOOD, METAL, AND GLASS.

82. Wooden Letters.—Relief letters are those that are raised above the sign surface, and are usually made of wood, unless the sign plate itself is of metal, in which case the letters are of brass cast from wooden patterns. The manufacture of wooden letters is such a simple matter that many sign painters undertake the whole process. The outline of the letter is drawn with coach black on thin Manila paper which is glued

on the surface of the lumber and then sawed out, and only the best kiln-dried pine plank should be used. The edges may then be beveled or rounded as desired. If the latter, the only tools necessary are a chisel and a rasp to round the letters, after which they should be finished by using very coarse sandpaper, and a smooth surface is then produced with fine sandpaper.

83. Large Wooden Letters.—Large wooden letters used on the roof of buildings or other elevated places are made and put up so as to stand out in relief against the sky, and consequently must be much larger than they actually appear from the ground. These letters, although reaching in some cases a height of 8 or 10 feet, are simply constructed and easily put in place. They are usually made of $1\frac{1}{4}$- or $1\frac{1}{2}$-inch lumber, which must be well seasoned, and each stroke of the letter mortised and tenoned to give strength, as shown on edge of letter in Fig. 7. At least two angle irons should be used on the bottom of each letter, of sufficient length to raise the letter from the roof, and two round braces behind; the size of the latter would vary according to the size of the letter. A $\frac{1}{4}$-inch rod, extending over all the letters, is fastened on the tops by means of staples, and protects all single-stroke letters, such as the I, J, L, etc., and gives the whole sign sufficient strength and stiffness to withstand a violent wind storm. These letters, in order to show to the best advantage, should always be painted black, and the irons lead color.

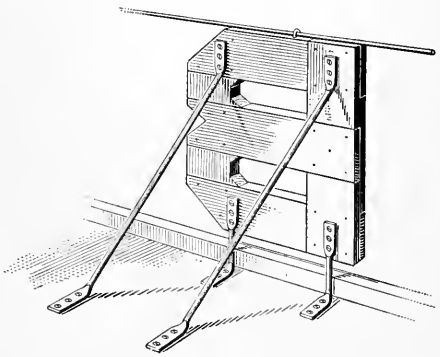


FIG. 7.

84. Metal Letters.—The metal letters, usually fastened on the brass or white-metal sign plates, are cast from wooden patterns, as before stated, and are afterwards filed, buffed, and plated with gold or nickel, to protect them from the weather.

They are fastened on the plates with screws, holes for which are drilled in the center of the letter and through the sign plate. To locate the points for the holes, the letters are carefully placed on the plate where desired, and whiting is dusted around the edges, thus outlining each letter. Two holes are drilled through the plate in the center of the space covered by the letter, after which the letter is again placed on the plate, to locate exactly the space where holes are to be drilled in the letter. The letters are then drilled, tapped, and screwed on from the back of plate.

85. Compo Signs.—Compo signs, the letters of which are also in relief, are molded signs made by pressing a wooden-pattern design into "compost," or composition, which may be either the material used for stucco work (a sized plaster) or the compo used in the manufacture of picture-frame moldings. These signs when colored are made very attractive, especially for advertising purposes.

86. Wire Signs.—Wire signs may also be of an artistic design, the character of which will depend entirely on the shape of the framework. Ribbons and panels can be fastened back to back on wirework, and such a sign will not catch the wind, and may be made to read from two opposite directions.

87. Gas-Pipe Frame Signs.—The gas-pipe frame signs, generally used in London, England, are easily constructed, and for advertising purposes are valuable, as they can be read several miles away. The size of this style of sign is limited only by the amount of the roof surface to which the braces or wire can be fastened. The frame may be the extreme width of the building, as the wires or braces are fastened in two opposite directions only. The letters are of wood, and are hung between the sections of the frame, as shown in Fig. 8. This sketch shows a sign 45 feet in width by 36 feet in height (the average length of the gas pipe is 15 feet), made to read from one direction only. A wire brace extends from every intersection of gas pipe to a staple in the roof or wall.

88. Advertising Signs on Brick Walls.—These sometimes reach immense proportions. It is not unusual to see the sign painter begin his design at any part of the work, as the panel may be a hundred feet or more in length or height. The work is executed, therefore, from a miniature design or scale, which in this case could be either $\frac{1}{8}$ or $\frac{1}{4}$ inch to the foot; and to insure against mistakes it is divided into blocks 10 feet

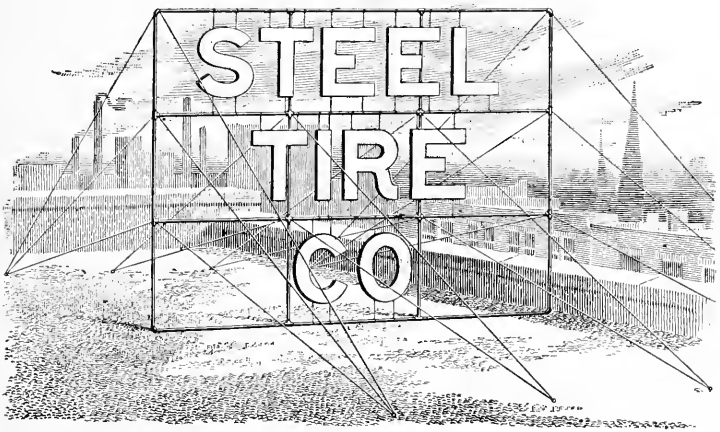


Fig. 8.

square, and lined off on the sketch with red ink. Two or three plumb-lines dropped from the roof of the building from points 10 feet apart, with tapes tied around them at every 10 feet of their length, will locate each square on the building, and work can be carried out with as much certainty, at any part of the design, as though the whole sign were but 10 feet square.

89. Transparent Signs.—Electric lighting has done much to develop this branch of sign painting, and signs that would otherwise be unseen after dark can be so arranged as to serve the twofold purpose of advertising and illuminating. The materials usually employed for transparent signs are common sheeting, white Holland shade cloth, and frosted and stained glass. Many beautiful designs are made of the stained glass, framed in sheet metal surrounded with scrolled ironwork.

90. Unlimited Glass Signs.—It is not an uncommon thing in Europe to see the name of some periodical, or of a business firm, stretched across a three- or four-story building, covering almost the entire front and reaching from the lower left corner above the store front to the roof. This style of sign is usually constructed of the heavy-line script letter, and is made of any rough lumber, of uniform thickness, sawed to the design required. The whole design is firmly secured together, and opal glass is cut to cover the face, after first coating the wood with white lead. The opal glass is fitted so as not to leave too wide an opening where joined, nor to project beyond the edge. The sign is then covered along the edge with zinc, firmly tacked or nailed, and turned over on the face in the form of a half-round molding, which serves to hold the opal glass in position.

91. Hanging the Sign.—The value of a sign depends on its finished appearance when placed in position on the outside or inside of a building, and the sign painter should not allow his artistic taste or ability to cease with the production of a piece of work that may indicate his skilled eye and hand ; but he should study the relation of his sign to its surroundings, and arrange its final fastenings accordingly. These should, first of all, be the securest possible, and be capable of resisting the severest windstorms, but they may also be attached without causing the legibility of the sign to be impaired or its neatness marred. Therefore, in hanging signs, do not allow the work or trappings used to show more than is absolutely necessary, unless they are of an ornamental nature. Architectural ironwork is used for swinging signs, either as an ornamental crane, or in scrollwork conforming to some characteristic design, such as a heraldic shield or panel.

ELEMENTS OF LETTERING.

Elements of Lettering.

(1) (*a*) What name is given to the earliest form of writing? (*b*) By whom was it used?

(2) What are "rustic" letters?

(3) Name two styles of letters that came into existence prior to the 15th century.

(4) What are "illuminated" letters?

(5) What is meant by the term *elongating?*

(6) What class of people were skilful in the art of lettering during the period immediately preceding the 15th century?

(7) What is meant by the term *interlacing?*

(8) On what materials can transparent water color be used to the best advantage?

(9) What is meant by a "part panel"?

(10) What is the "stroke" of a letter?

(11) What is meant by the term *background?*

(12) What are "cut-in" letters?

(13) On what side of the letter should the shade be placed?

(14) (*a*) What is a "background stencil"? (*b*) How does this differ from the regular letter stencil?

(15) What is meant by the term *telescoping?*

(16) What two forms of numerals are used in modern lettering?

(17) What material is most suitable for making stencil patterns?

(18) For what special class of work are tin-foil stencils used?

(19) What style of brush is best adapted for use in stenciling?

(20) What styles of letters are best adapted for illuminated capitals?

(21) In cutting stencil patterns, what method is safest to follow in order to avoid the possibility of cutting off ties?

(22) How is the design for the second stencil placed on the first to insure accuracy?

(23) What alphabet is the mother of all modern styles of writing?

(24) About how many signs may be stenciled before the stencil pattern should be cleaned?

(25) On what part of the letter should the highlight be placed?

(26) How was the letter *H* expressed when first introduced into the alphabet?

(27) When letters are placed on an inclined panel, what position should they be given?

(28) What is meant by the term *condensing?*

(29) What is the difference between mechanical and free-hand lettering?

(30) What are the "ties" in stencil patterns?

(31) In what way did the invention of the printing press directly benefit the art of writing?

(32) On what angle should the shade of the letter be placed?

(33) Of what importance is letter-face shading?

(34) What is the "spur" of a letter?

(35) Where would you place the possessive apostrophe in the following: "Mens and Boys Clothing"?

(36) How is the block shade placed on a letter?

(37) How many forms has the cast shadow?

(38) What are the three chief classifications of letters?

(39) When are colors applied in their dry state?

(40) Name some of the styles of letters known exclusively as "American writing."

(41) For what purpose is the stencil pattern used?

LETTERING

—AND—

SIGN PAINTING.

Lettering and Sign Painting.

(1) At what angle should a lettering table be inclined?

(2) Of what material are transparent signs usually made?

(3) How is a design transferred to a brass plate for the purpose of embossing?

(4) For what purpose are large wooden letters used?

(5) How are parts of the brass plate protected where it is to be left unetched?

(6) How are aluminum and gold bronze applied to a sized surface?

(7) What is a *neutral* color?

(8) What is the *priming coat?*

(9) What acid is used for etching brass plates?

(10) For what purpose are metal letters used?

(11) (*a*) How many compasses are necessary for use in sign painting? (*b*) Describe the largest.

(12) What is *flock?*

(13) In making letters one inch or under, what brush should be used?

(14) What are the primary colors?

(15) What is the principal use of the T square in sign painting?

(16) What is the cause of a color *creeping* after being applied?

(17) How can a wire sign projecting from a building be made to read from opposite directions?

(18) What should be the height of a lettering table?

(19) What name is given to the long-hair brush used to pick up the gold leaf?

(20) Describe the transparent shade.

(21) How is the penetrating quality of pitch destroyed in pine sign boards?

(22) What gauge of engraving brass is generally used for the embossing process?

(23) From what oil is slow size made?

(24) How is gold leaf prepared for use where the wind is too strong to use the tip?

(25) How should lettering brushes be preserved from drying or hardening?

(26) What are compo signs?

(27) What two general kinds of size are used for gilding on wood or metal?

(28) What is meant by the term *tint?*

(29) What is the most durable color when exposed to the elements?

(30) What is used as a backing for pearl filling to produce a solid letter?

(31) What are the principal classes into which colors are divided?

(32) What mixtures should be used for lettering on cardboard?

(33) What size is used for Etruscan gilding?

(34) What is the spectrum shade?

(35) When are colors in harmony in their combination?

(36) What color is used in the mixture of size for gold?

(37) What are relief letters?

(38) How is the asphaltum coating removed after the brass plate is taken from the etching bath?

(39) What is a secondary color?

(40) What is meant by the term *cold color?*

(41) How many brushes are recommended as necessary for practice work?

(42) What acid is used for embossing on glass?

(43) When are colors said to be in contrast?

(44) To what depth should the letters be etched in glass?

(45) (*a*) What is a *shade* of a color? (*b*) How may this be produced?

(46) How should cotton cloth be prepared before letters are applied?

(47) What is meant by the term *warm color?*

(48) What materials are used to fill letters etched in brass plates?

(49) On what colors is the glaze shade used?

(50) In embossed work, to what depth should the acid be allowed to eat the brass plate?

(51) What would be the result if a coat of paint were placed over another before the first dried, one being a slow-drying and the other a quick-drying mixture?

(52) What adhesive material is used in the preparation of gilding water size?

(53) Name two semineutral colors.

(54) How many methods are there of striping by means of a lettering brush?

(55) When is frosting on glass used as a ground for lettering?

(56) What is considered the least durable color?

(57) How is a design that is to be gilded placed on a window glass?

(58) What is the best protection against frost that may be applied to a finished letter on glass?

(59) What is *smalt?*

(60) What mixture of colors produces purple?

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