

PRINTING BLOCKS

and how they are made

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Process Block-Making

By JAMES B. AIKIN, *Irish Photo Engraving Co., Ltd.*



HIS short description of the making of Half-tone and Line blocks is an attempt to put in a convenient form the matter and illustrations of my lectures on this interesting subject. I hope the many friends who have expressed a wish to have the matter of my lectures in a handy shape for reference will find this booklet both interesting and useful.

I will try, first, to clear up some of the mystery that seems to surround photo engraving, or the art of engraving pictures on metal, by photography, so that they can be reproduced in the printing press.

Photo engravings belong to the relief class of printing processes, of which the oldest representatives are woodcuts and type. There are two principal kinds of photo-engraved blocks, the line block and the half-tone block, all others being merely modifications or combinations of these.

The line block is the process used to reproduce any original which consists of pure black and pure white, as, for example, a pen-drawing in Indian ink on white card. Line blocks *can* be made, with more or less trouble, from some originals which are only *approximately* white and black. For instance, a line block could be made from a drawing in red ink on light blue paper, but this is merely because red happens to be a colour that photographs like black, and blue a colour that photographs like white. Any block-maker who knows his business and lays himself out to serve his customers will always do his utmost to make a passable line block from an abnormal original, but it should be borne in mind that the ideal original is "pure white and pure black."

Line block-making is a purely mechanical process, every line of the original being reproduced faithfully

PRINTING BLOCKS

with all its imperfections, and without any additions or alterations by hand.

In the old wood-cut days it was sufficient to provide a very crude rough sketch embodying the idea, and the hand engraver would turn out a respectable result. In photo-engraved blocks you must remember that a poor drawing will reproduce just as you send it, unless you give instructions to re-draw it properly.

I have reproduced sketches so fearfully and wonderfully drawn that it needed constant vigilance to keep the staff from throwing them into the dust bin, in the belief that they were the products of the message boy's idle moments. One particularly vile attempt reached me with a pathetic request from the artist to "give it a bit of touching up, if it wouldn't cost anything extra." Could I break his heart by telling him that *burning up* was the only thing that would do it any good? Usually, however, by a merciful dispensation of Providence, the worse the photo or sketch is, the less able is its perpetrator to see any fault in it. I early learnt to keep adverse criticism to myself until I had made sure I wasn't talking to the proud creator of the drawing under discussion.

The first requisite, then, is an original in pure black and white, drawn in such a way that it will give the desired effect when reproduced exactly line for line, *in the size required*. This last point is most important. A drawing may look all right when reproduced same size, but may give a most disappointing result when reduced to one half or one quarter.

Some artists seem unable to vary their shading to allow for the reduction, and draw just as close shading lines in a sketch that is to be reduced to one quarter, as in one that is to be reproduced same size.

Nearly all fashion artists fall into this mistake. Perhaps they don't know that newspaper space is so dear that few advertisers use blocks more than five or six inches deep, while many use blocks of only three or four inches. Whatever the reason, the fact remains that their favourite size for a full-length figure is between 12 and 18 inches deep. I have handled drawings 18 inches deep, in which every involution on an ornamental button was drawn with lavish detail. When the whole figure

AND HOW THEY ARE MADE

was reduced to a block three inches deep it would have taken a sharp eye to find the button, not to mention its ornamentation. (Compare Fig. 1 and Fig. 2.)

There is one easy way to prevent this waste of time, which is presumably included in the artist's charges. When ordering a drawing of any sort tell the artist the size you mean to have the block made, and instruct him



Fig. 1.

A small portion of a large drawing, showing how detail is lost when much reduced as in Fig. 2.



Fig. 2.

to make the drawing not more than twice that size. If the block is for daily newspaper work, less detail and more open shading is desirable.

The block-maker's first step is to fasten the pen-and-ink drawing on the copy-board of a camera, illuminate it with two powerful arc lamps, and make a negative of the size required. Most people nowadays understand photography, so I can use photographic terms freely, but when I say "negative" you must dismiss from your minds the idea of the dry-plate negatives or films

PRINTING BLOCKS

you are accustomed to. We use the old wet-plate process, which has many advantages for our purpose. In the first place, a wet plate negative gives great *contrast*. If you copied a pen-and-ink drawing on a dry plate you would probably be able to see through the densest part. In a wet plate this would be absolutely opaque. In your dry plate the black parts of the drawing would be more or less veiled. In a wet plate they would be perfectly clear glass. In the second place, the wet plate is quick in manipulation. When I tell you that a wet plate requires about eight times the exposure of the slowest dry plate, you will wonder where the speed comes in. The *exposure* is slow, but the later operations are much quicker. The preparation of the plate may take a couple of minutes, the development about a minute and a half, fixing half a minute, washing a few seconds. Intensification and so on takes place with equal quickness, and, best of all, the wet plate can be dried off by heat in a few moments.

All of the operations, from development onward, are done without a dish, the plate being held by one corner and the various solutions flowed over it.

In wet-plate photography the sensitive surface is prepared by coating a clean glass with collodion, which is gun-cotton dissolved in ether and alcohol, with certain other chemicals added. The collodion is poured on the plate as shown in Fig. 3, flowed evenly over it, and the excess returned to the bottle. The film of collodion "sets" in a few seconds, but is not sensitive to light until it is immersed in the silver bath. This is a solution of silver nitrate in distilled water. The dish containing the silver bath is tilted so that the solution lies at one end. The coated plate is placed in it, and the bath allowed to flow smoothly over it when the dish resumes the level position (Fig. 4). If the flow of the liquid is checked for even a fraction of a second, or if it splashes, a mark is produced which may spoil the plate. The silver of the bath combines with the chemicals in the film to form a compound which is sensitive to light, and the remaining operations have to be conducted in an orange light, until the plate is "fixed."

After a few minutes in the silver bath the plate is lifted out, drained, and placed in the dark slide of the

AND HOW THEY ARE MADE

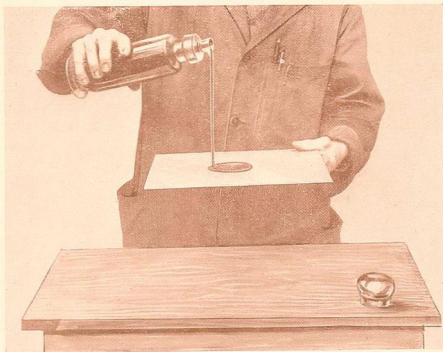


Fig. 3—Coating Glass Plate with Collodion.

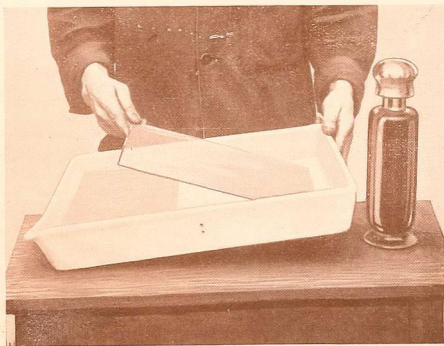


Fig. 4—Placing Coated Glass Plate in Silver Sensitising Bath.

PRINTING BLOCKS

camera. Fig. 5 shows the sensitive plate in the slide, just before being placed in position at the back of the camera, the shutter being drawn to allow it to be seen. In practice, of course, this shutter is not drawn until the slide is in position, or the plate would be spoiled by light. The camera used is of very solid construction, and is able to take a negative of 15 ins. or 20 ins. each way.

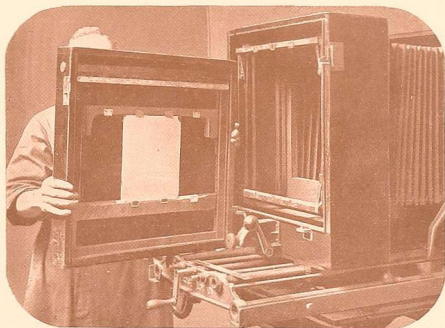


Fig. 5—Sensitive Plate in Dark Slide, about to be placed in position at back of Camera. (The Shutter is withdrawn to show the Plate.) Note strip of Blotting Paper to absorb the drainings from the Plate, which is exposed wet.

Fig. 6 shows a modern type of “all metal” camera used in block making. Fig. 7 shows the original on the copy-board, illuminated by two powerful arc lamps.

In this photo you can see the right-angled prism by means of which the camera “sees round a corner.” The prism produces a negative reversed from right to left, the necessity for which you will perceive if you consider that an ordinary photographic print on paper is a *final* result, while the block-maker’s print on metal is only the *semi-final* stage, and must be reversed from right to left to print correctly in the final result in the printing press. A larger view of the lens with the prism attached is seen in Fig. 8.

AND HOW THEY ARE MADE

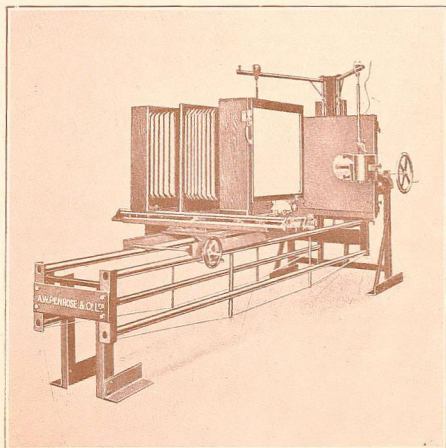


Fig. 6—Latest type of Process Camera, built of Steel to ensure rigidity.

PRINTING BLOCKS

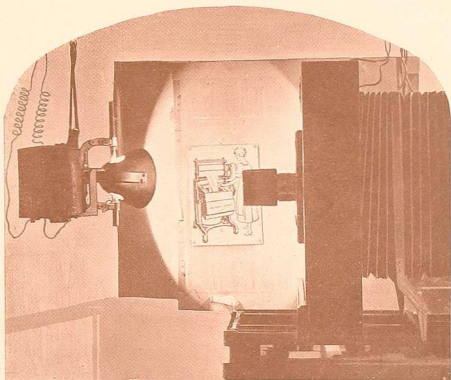


Fig. 7—Drawing pinned on Copyboard lighted by 2 Arc Lamps. Note Prism fixed on Lens.

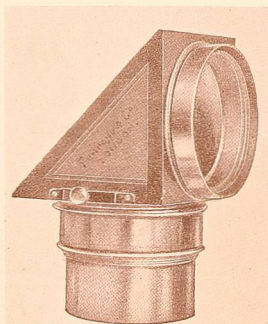


Fig 8.
Lens
with
Prism
attached.

AND HOW THEY ARE MADE

• An exposure in the camera of from 30 to 60 seconds is usually sufficient. The plate is then developed, fixed, intensified, blackened, and dried, and is then ready to be printed on a piece of prepared zinc. Fig. 9 shows the appearance of a line negative.

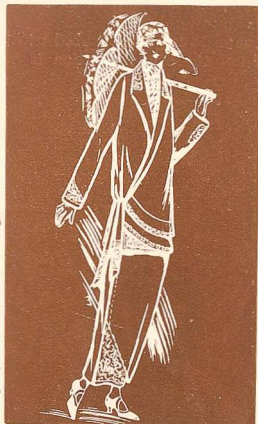


Fig. 9

A
Line
Negative.

A piece of zinc plate is coated with a solution of white of egg and bichromate of ammonium, and dried by being revolved quickly over heat by a "whirler" (Fig. 10). It is now ready to be placed in a printing frame and exposed to light through the line negative.

Here, again, photographic readers must reconsider their previous ideas of a printing frame. The spring pressure that is sufficient to keep a piece of P.O.P. in contact with a glass plate or flexible film is of little use when the problem is to force a sheet of glass into perfect contact with a sheet of zinc perhaps 15 inches by 18 inches. Fig. 11 shows the frame used. It is of extremely solid construction, and has a front of plate glass one inch thick to stand the immense pressure applied by turning the hand-screws at the back. Fig. 12 shows the

PRINTING BLOCKS

frame under two arc lights. When sufficiently printed, the zinc plate is "rolled up" all over with a printer's roller and a special "tacky" ink. In the printing-frame the light has acted on the coating through the transparent parts of the negative which represent the lines of the drawing, and the effect of the light on the bichromate is to render the coating insoluble.

When the zinc plate is gently rubbed with cotton wool under a water-tap the soluble portion is washed away

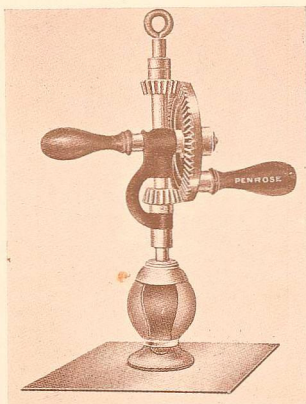


Fig. 10.—"Whirler." For coating metal plates.

and carries the film of ink with it, while the insoluble parts, representing the lines of the drawing, remain fixed on the plate. Fig. 13 shows the plate during the washing. The dark half is the film of tacky ink which originally covered the whole surface, the other half shows the design on the zinc "developed" by washing under the tap. Fine powdered bitumen is then applied to the plate, which adheres only to the tacky ink lines forming the design.

AND HOW THEY ARE MADE

- o The next stage is the "etching" or eating away, of the zinc surface wherever it is not protected by the acid-resisting ink and bitumen lines.

There are many devices used for this etching process, varying from a simple dish containing nitric acid and water, in which the zinc plate is immersed and rocked,

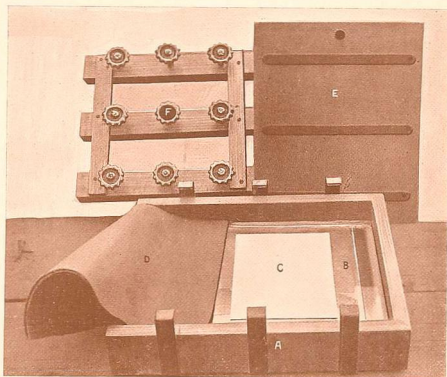


Fig. 11—Printing Frame.

a Body of Frame. b Negative. c Metal Plate. d Felt Pad.
e Wooden Back to equalise pressure of screws. f Hand-screws which force the metal plate into contact with negative.

to an elaborate machine in which a spray of acid is directed against the plate by compressed air.

Fig. 14 shows a form of etching machine in common use, in which a revolving paddle throws a spray of acid against the face of the plate.

In whatever kind of machine the etching is done, a point soon arrives at which the eating away action of the acid begins to *undermine* the lines of the design, which, it must be remembered, are protected only on their top surface. To overcome this undermining tendency a very

PRINTING BLOCKS

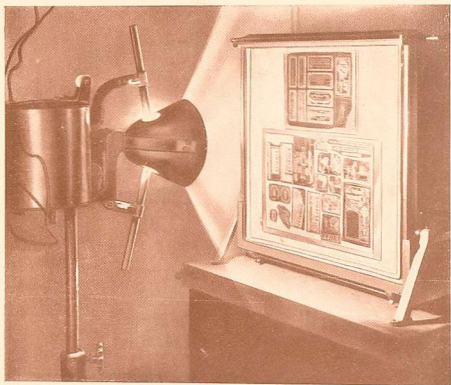


Fig. 12—Metal plate under negative in frame, being printed by arc light. This frame is different from the pattern shown in Fig. 11, and forces the negative and metal plate into contact by a vacuum produced between front glass and an air-tight rubber backing.

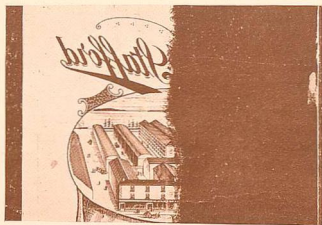


Fig. 13—Half-washed Line Print on Zinc.

AND HOW THEY ARE MADE

interesting process is used, which is rather difficult to explain even to those who examine the zinc plates.

The appearances to be described are so minute as to

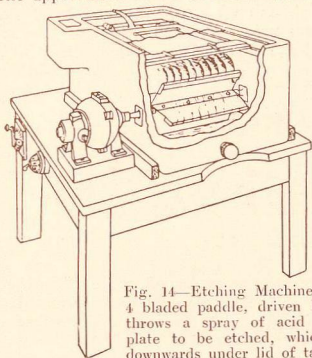


Fig. 14—Etching Machine in which a 4 bladed paddle, driven by a motor, throws a spray of acid against the plate to be etched, which lies face downwards under lid of tank.

require a magnifier to appreciate them, so I have prepared a series of wood, metal, or wax models, on a scale about twenty times greater than natural size, and it is

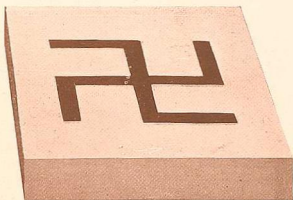


Fig. 15—Enlarged model of Zinc Line Plate before Etching.

from photos of these models that the illustrations have been made. Fig. 15 is an enlarged model showing appearance of zinc plate before etching, the design

PRINTING BLOCKS

chosen being a swastika. Fig. 16, after first etch, shows that an appreciable thickness of zinc has been eaten away by the acid, leaving the design in slight relief.

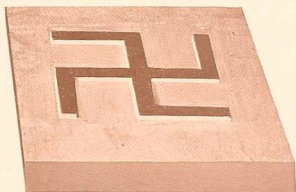


Fig. 16—Model of Zinc Plate after 1st Etch.

But if the etching were carried any further the unprotected *sides* of the lines would be undermined. To prevent this the zinc plate is dried and brushed over

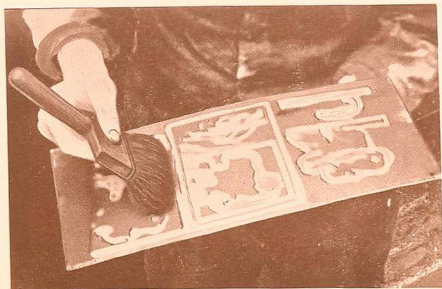


Fig. 17—Four-way-powdering with "dragon's blood."

with a resinous powder, called "dragon's blood" from its bright red colour. This brushing is done in one direction only to start with, say from left to right of the plate (Fig. 17).

AND HOW THEY ARE MADE

The result is that a little bank of powder is banked up on the left side of every raised line running vertically or thereabouts.

A slight heating causes the powder to melt and adhere. The plate is turned round a quarter way and the powder brushed over it again, from top to bottom, the powder being heaped up against the *upper* side of every line running in a horizontal direction.

The brushing takes place also from right to left and from bottom to top, the slight heating to fix the powder following each brushing.

We now have every line on the plate, no matter what its direction, protected on both its sides by a bank of



Fig. 18—Model of Zinc Plate after first powdering to protect sides of lines.

acid-resisting powder, just as a snow-drift is banked up against a wall. This stage of the plate I have tried to represent by Fig. 18, in which the dragon's blood is shown by the lighter toned sloping rim round the swastika.

The plate is now ready to stand a much longer exposure to the acid, but eventually the undermining action has again to be checked by a fresh "four-way-powdering," as it is called. Fig. 19 shows the appearance after the second etch, and Fig. 20 after the second reinforcing with powder. A third, and much stronger, etch can now be given (Fig. 21) after which all the acid-resisting material is removed by potash and methylated spirits. Fig. 22 shows how the plate now appears.

PRINTING BLOCKS

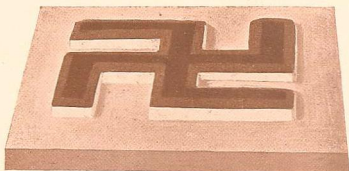


Fig. 19—Model of Zinc Line Plate after 2nd Etch.

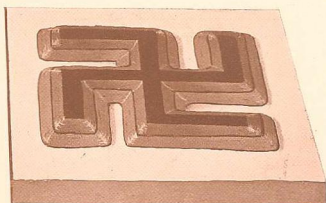


Fig. 20—Model of Zinc Line Plate after second application of Powder.

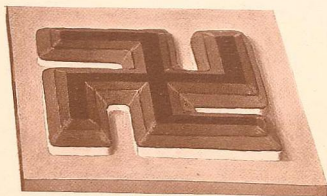


Fig. 21—Model of Zinc Line Plate after 3rd Etch.

AND HOW THEY ARE MADE

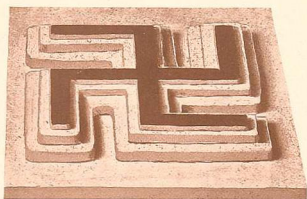


Fig. 22—Model of Zinc Line Plate after acid-resisting powder has been removed, showing flange left by each powdering.

The three powderings have accomplished their purpose of protecting the sides of the lines, but they have left three projecting flanges or terraces.

These, if not removed, would “print up dirty” when the roller passed over the block in the printing press. To get rid of these flanges the whole plate is rolled up again with a very stiff, waxy ink, the roller used being

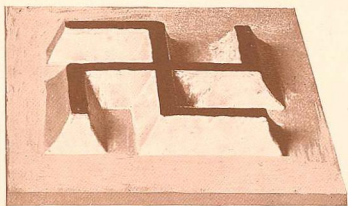


Fig. 23—Model showing final appearance of Zinc Line Plate after flanges have been rounded off by the 4th Etch.

so hard that it touches only the original top surface of the lines, and does not dip down on to the flanges or shoulders left by the powdering. The plate is again put in the etching machine, and a very short exposure to the acid rounds off the shoulders, while the film of waxy ink protects the top of the lines. The plate should now present the appearance shown in Fig. 23.

PRINTING BLOCKS



Fig. 24—Router, a quickly-revolving tool for cutting away the waste portions on a block.

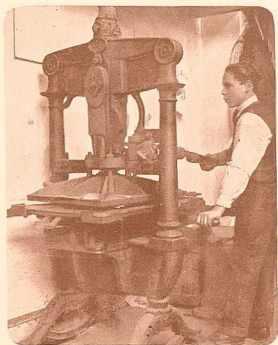


Fig. 25—Proving the plate on a hand press.

The remaining operations are the routing, or cutting out the large open spaces by a revolving tool (Fig. 24), proving the plate on a hand-press (Fig. 25), and mounting it on a block of wood which brings it to type height (Fig. 26). Fig. 27 shows the finished line-block.

AND HOW THEY ARE MADE

It will be observed from this description that the etching of a line-block is a lengthy process. The trouble of powdering, and the time occupied on each etch, does not increase in proportion to the size of the plate, so it is usual to combine several subjects on one large plate of

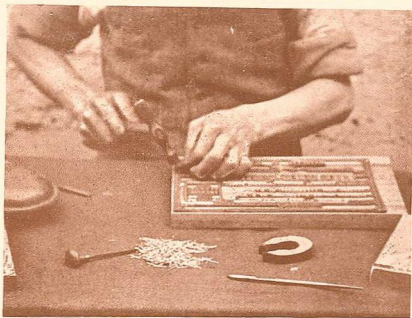


Fig. 26—Mounting the line-block on mahogany to bring it to the same height as type.



Fig. 27—A finished line-block, opening pierced for type.

PRINTING BLOCKS

zinc for etching. The different subjects are afterwards cut up and mounted as separate blocks. Fig. 28 shows a number of subjects combined on one plate by stripping the photographic films of the various negatives on to one large glass. In this way each job can receive its full measure of attention and full depth of etching, but the method does not lend itself to turning out every small job in a couple of hours after receiving the order. Fig. 29 is rather a curiosity. It is a proof from a line-block etched by an amateur, and shows in a marked way the dirty edges of the lines caused by the shoulders not being cleanly etched away. Certain parts also which were intended to be white are so shallow that they print black, save for a narrow white edge.

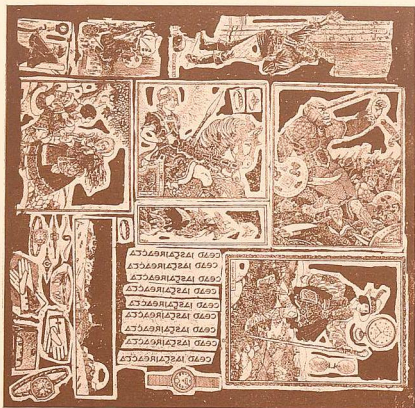


Fig. 28—Sheet of metal with many subjects being etched together, afterwards to be cut up and mounted as separate blocks.

AND HOW THEY ARE MADE

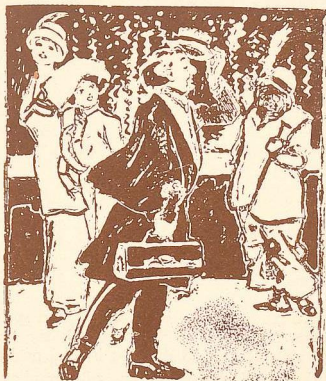
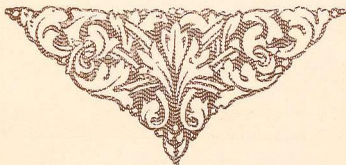


Fig. 29—A line-block etched by an amateur, showing dirty edges of lines caused by insufficient etching.



PRINTING BLOCKS

THE HALF-TONE PROCESS

We now come to the half-tone process blocks, also called "tone blocks" and "photo blocks."

First of all, what is meant by "half-tone"? I take it that most of the readers of this booklet are better informed on the point than a customer I remember, who wanted a small block for a job he was very anxious should turn out well. I quoted him for a half-tone block, but he looked rather dubious. I tried to reassure him. I did my best to give him the impression that his block would attain the highest point of perfection under the combined efforts of the entire staff and my own careful supervision. Still he didn't seem happy. At last he said, "I don't quite like the idea of a *half* tone block. Expense is no objection; if I paid something extra could you not give me a *whole* tone block?" In spite of my explanations, I fear he went away with the fixed idea that he was getting only half what he had paid for.

If you do not all know what an ordinary photographic negative looks like, you are certainly familiar with the "positive" or print from it. Every photograph is made up of light tones, shadow tones, and those which



Fig. 30—Result of printing an ordinary photographic negative on metal.

Compare with Fig. 32.

AND HOW THEY ARE MADE

lie between these two extremes, the middle tones or "half" tones. The process got its name because it enables us to preserve the half tones of the picture. Many people think that if they send us their original negative it should save us making another, and so result in a cheaper block. Let us make the experiment. Fig. 30 shows the result of printing an ordinary negative on sensitised metal by the method described in the Line process. The highest lights and the darkest shadows are there all right, but there is an entire absence of middle or half-tones.

When an artist is confronted with the task of representing the varied tones of nature under the limitations of a pen and ink drawing, he translates the tones of the landscape into a series of black lines of shading. By making these broad or fine, close together or widely spaced, he succeeds in giving a close imitation of the varied middle tones he sees before him.

The problem of reproducing the middle tones of a photograph is very similar to the artist's problem, and it was solved in the very same way, by breaking up the tones of the photo into pure white and black.

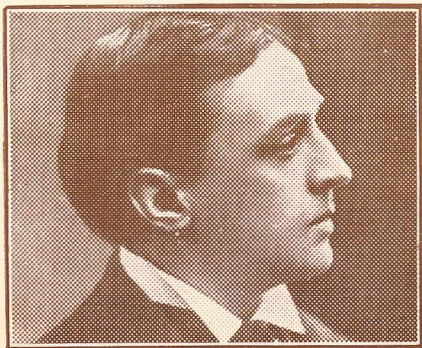


Fig. 31—Middle tones preserved by the half-tone dots, 44 to the inch.

PRINTING BLOCKS

The artist's middle tones are usually in varying black lines, while those of the blockmaker are in varying black *dots*, but the principle is the same. In Fig. 31 you can see that black dots, varying from small specks to large



Fig. 32—Middle tones preserved by the half-tone dots, 150 to the inch.

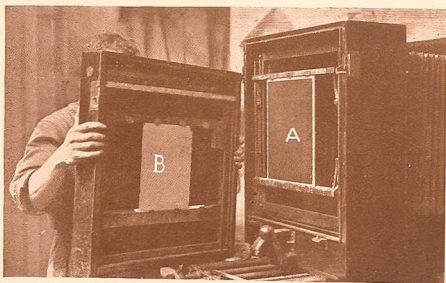


Fig. 33—Half-tone screen (A) in position at back of camera, almost in contact with sensitive plate (B) when slide is in place.

AND HOW THEY ARE MADE

dots finally touching and merging into one another, represent very effectively the smooth shading of the photograph. Fig. 31 has been purposely made very coarse, to make the dots quite visible, but in Fig. 32 you see the result achieved in a much more perfect way, by increasing the number of dots to the inch from 44 to 150, so that they do not obtrude themselves unpleasantly on the eye. This dot effect is produced by the half-tone screen. The screen is of glass, on which, by a very delicate mechanism, has been ruled a series of fine, parallel black lines. A second glass carries a similar series of lines. When these two glasses are cemented together, face to face, the black lines cross each other at right angles, leaving tiny transparent openings between. This screen is placed at the back of the camera, immediately in front of the sensitive plate, and

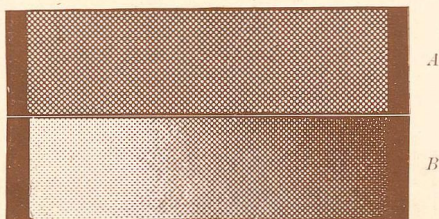


Fig. 34—Portion of screen showing uniform-sized openings (A). Shaded strip of paper copied through screen, showing varying sized dots, according to tone of original (B).

almost in contact with it (Fig. 33). The photo to be reproduced is lighted in the same way, and exposed in the same way as described in the Line process, with the important difference that the rays of light coming from the photo have to pass through the little openings of the screen before reaching the sensitive plate. Each opening of the screen allows a pencil of light to fall on the plate, and as all the openings are of course uniform, it might be expected that equal-sized dots would be

PRINTING BLOCKS

formed, but this is not the result. It is found that the rays of light coming from a very white part of the photo make a stronger and larger dot on the sensitive plate than those coming from a darker part. Fig. 34 shows a portion of the screen enlarged, and the varying sizes of dot caused by copying a shaded strip of paper. Fig 35 is the half-tone negative from which Fig. 31 was made. The half-tone negative thus produced through the screen is printed on a piece of copper coated with a thin skin of

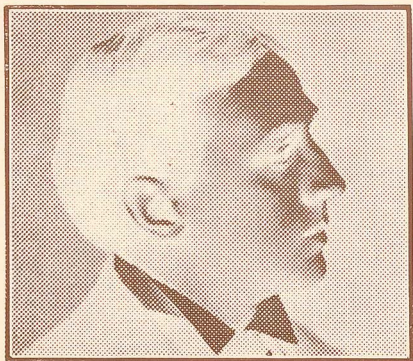


Fig. 35—Half-tone negative from which the positive (Fig. 31) was made.

fish glue, made sensitive to the light by bichromate of ammonium. The same whirler and printing frame are used as in the line process already described.

When acted on by light through the transparent spaces in the half-tone negative (see Fig. 35), the fish glue becomes insoluble and sticks to the copper, while the part not acted on by light washes away under the tap.

The little dots of fish glue remaining on the copper represent the picture. While wet they are very soft, but when dried and "baked in" over a gas ring, they become hard and shiny, and of a dark chocolate colour.

AND HOW THEY ARE MADE

- At this stage the fish glue, now called enamel, forms a very efficient acid resist. The plate is etched in a machine similar to that used for zinc (see Fig. 14), but perchloride of iron is used instead of nitric acid. The etching liquid eats away the bare copper, but cannot attack the metal where it is protected by the dots of fish glue enamel, and these finally stand up in relief above the etched surface and receive the ink from the roller when it passes over them in the printing press.



Fig. 36—Enlarged section of half-tone plate before etching. The projections on upper surface represent the dots of acid-resisting enamel.

The undermining action, as described in line etching, takes place to a small extent in half-tone also, but as the dots are very close together, no great depth of etching is necessary, so the undermining does not need to be checked by the powdering process as in line etching. In fact a very interesting part of the work, known as "fine



Fig. 37—Enlarged section of half-tone plate after a general etch.

etching," depends on, and takes advantage of, this undermining effect.

Fig. 36 represents an enlarged section of a half-tone plate, before etching, the fish glue dots being in very slight relief on the surface.

After a first general etch the dot is seen to be in higher relief, and at the same time has grown smaller (Fig. 37). After a further etch the depth is greater still, while the dot has been reduced to a fraction of its

PRINTING BLOCKS

former size (Fig. 38). An impression of the plate at the stage shown in Fig. 37 would show an area covered with large black dots, leaving comparatively little white paper visible (Fig. 39). Now let the plate be brought to the



Fig. 38—Enlarged section of half-tone plate after final etch.

stage of Fig. 38, and another impression be printed (Fig. 40). The black dots have become so reduced in size that more white paper is visible, and the tone is consequently much lighter.

But the "fine etcher" very seldom wants to lighten the tones all over the picture. After the first etch he

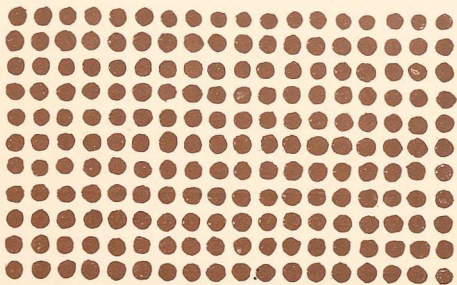


Fig. 39—Proof from half-tone plate after general etch showing how large dots give a darker tone.

decides that certain portions are as light in tone as required, so he covers up those parts by painting over them an acid resisting varnish which stops the reduction of the dot.

AND HOW THEY ARE MADE

After another etch further portions of the plate may have reached the required lightness of tone, and they are painted over in their turn.

This "staging," or "stopping out," as it is called, may be repeated three or four times, and in this way photos which are very flat and defective may be made bright and full of detail and modelling.

Fig. 41 shows in an exaggerated way a half-tone plate from a flat, dull, original before fine etching. The etcher paints his acid resist over the dots immediately surrounding the petals (Fig. 41A), and allows the acid to act longer on the dots forming the petals. The acid is also brushed

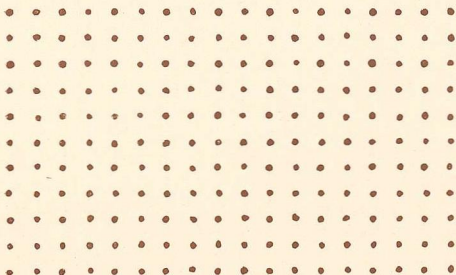


Fig. 40—Proof from half-tone plate after final etch, showing lighter tone due to size of dots being reduced.

over the dots around the outer edges, getting a final effect as in Fig. 42.

I suppose it is hardly necessary to say that the best possible originals should always be procured for block-making. Some people seem to think that we have some kind of magic wand that will transform a bad original into a good block. I remember once receiving a photo from which a block was wanted. I could hardly tell you all the ways in which this photo fell short of perfection. Have you ever seen the first attempts at photography of a small boy with a new "Brownie," who has "pressed the button" and tried to "do the rest" himself by the

PRINTING BLOCKS

light of nature? This was even worse. It was underexposed, overdeveloped, out of focus, and the print badly stained. The customer wrote:—Please make a first-class block of this. It is a spoiled print, but will be good enough for block-making.”

Perhaps we conscientious blockmakers bring this sort of thing on ourselves. It is a point of honour with us

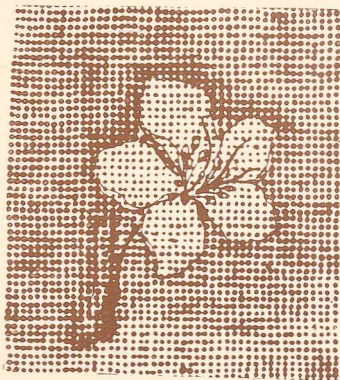


Fig. 41—Enlarged model of half-tone plate before fine-etching, showing want of contrast.

to try to improve a bad photo, but we like to get good ones now and then, just for a change.

Fig. 43 shows a proof from plate of an average photo after it has received a general etch all over. Fig. 44 shows the final result of the same plate. The difference is due to the local hand work of fine etching.

The last operation in making a half-tone block is the mounting on wood to type height. In mounting a line block, the nails can be driven in any of the sunken spaces which represent the whites of the picture.

AND HOW THEY ARE MADE

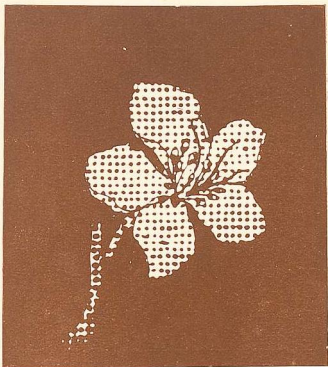


Fig. 41A—The plate painted over with acid-resisting varnish, leaving dots of petals and stem to be further reduced.

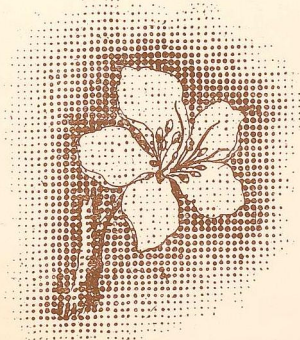


Fig. 42—Final result. The reduction in size of dots on petals and outer edges gives the desired contrast.

PRINTING BLOCKS

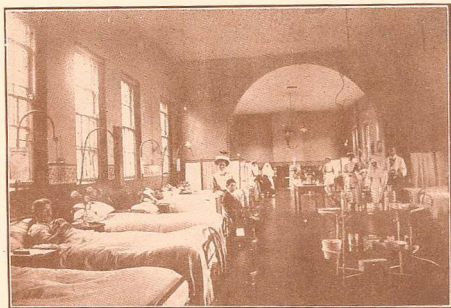


Fig. 43—Proof from plate of average photo after general etch.



Fig. 44—Proof from plate after fine-etching.

AND HOW THEY ARE MADE

In a half-tone squared-up block this is not possible, as the dots cover every part of the printing surface. A sunken shelf or rebate has therefore to be cut around the outer edges to take the nails. The machine that does this is called a beveller (Fig. 45), and the cut it makes is worth examining. The copper plate is moved under a quickly-revolving head carrying two cutting

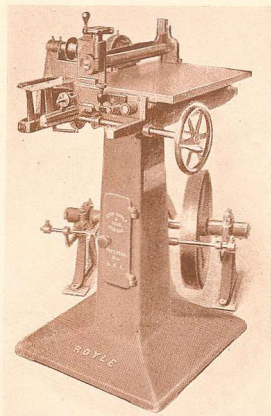


Fig. 45—Machine for cutting bevel or rebate around edges of a half-tone plate to take mounting nails.

tools, one of which follows in the track of the other. One tool cuts a broad shallow channel up to the border line of the plate, and the other a "V" shaped nick at the bottom of the channel. When bent back the metal breaks easily at this nick, bringing with it the waste edge of the plate, and leaving a rebate for the nails (Fig. 46 and Fig. 47).

PRINTING BLOCKS

The possibilities and pitfalls of fine etching are well illustrated in Figures 48 and 49. This was one of those underexposed pictures in which one can dimly discern a few pallid faces emerging out of a mass of rich velvety black shadows. Our best fine etcher undertook to "make a job of it" if given unlimited time. Fig. 48 is a fair representation of the plate before he began the fine



Fig. 46—Enlarged section of half-tone plate after bevelling.

etching. He toiled on it for eight solid hours, drawing in details which were faintly visible in the photo, and inventing others which he knew should have been there, but weren't.

His final proof is seen in Fig. 49. When the customer called I showed him the proof with some pardonable pride, expecting a word of praise for our efforts. The customer looked at it silently for a long time. Then he remarked:—"That thing in the far corner was a harmonium. You've gone and turned it into a table!"

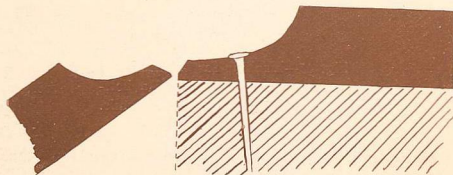


Fig. 47—Enlarged section of half-tone plate mounted on wood, waste edge being broken off at nick.

AND HOW THEY ARE MADE

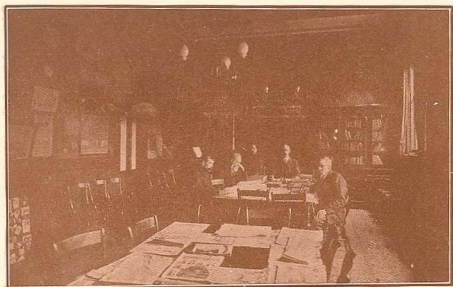


Fig. 48—Proof of half-tone plate from very poor photo, before fine-etching.

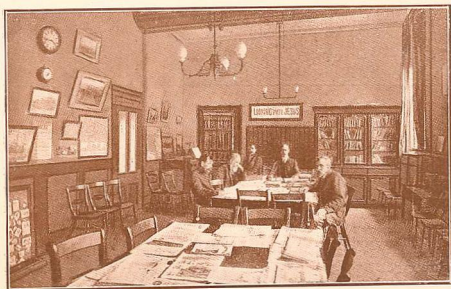


Fig. 49—Proof after fine-etching. An extreme case.

PRINTING BLOCKS

A few points to note when preparing originals and ordering blocks.

PHOTOS.—If these are taken specially for block reproduction, they should be slightly larger than the required block. This allows any necessary touching-up to be put in with more freedom, and ensures a smoother and more natural result when reduced in the block.

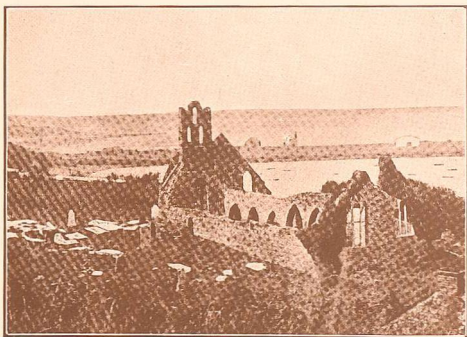


Fig. 50—"Interference pattern" caused by copying a half-tone impression again through screen.

SHAPE.—The photos should be of a shape to suit the space available for the block. I have often seen photos taken *vertically* on the plate when a horizontal picture was required, and *vice versa*.

PRINT.—The print should be on a glossy-surfaced paper, which shows details more clearly than a matt or rough surface. The colour of the print should be either black and white or a chocolate brown. Avoid extremely red, or very bluish, prints.

WASH DRAWINGS.—Wash drawings for half-tone should be drawn in pure washes of Indian ink, with a touch of

AND HOW THEY ARE MADE

- sepia to prevent the lighter washes from becoming bluish. It is not advisable to use body colour for such drawings, still less to mix methods and use body colour in one part and pure washes in another. The original should, of course, be drawn in the same proportion as the block is wanted, but rather larger.

HALF-TONE IMPRESSIONS AS ORIGINALS.—Try to avoid reproducing from an impression of another half-tone block. The screen already in the impression makes an



Fig. 51—Detail in small faces lost in 65 Screen.

“ interference pattern ” when copied again through the half-tone screen (Fig. 50).

SCREENS.—Having secured a suitable original, next consider what screen will suit the paper to be used. The following table may be found useful :—

For poster blocks a screen of from 30 to 40 lines per inch. Stereotyped newspapers and very

rough paper	...	...	55 to 65 lines	„
Newspapers (not stereotyped)	...		85 lines	„
Writing papers and printing papers without a glossy surface	...	...	85 to 100 lines	„
Supercalendered paper	...	...	100 to 125 lines	„
Art paper	...	...	133 to 175 lines	„

PRINTING BLOCKS

This list can be modified by the nature of the subject and the size of the block. For example, a portrait head and shoulders might with advantage take 100 screen in a size of 3 inches by 4 inches, while a complicated interior view or a group containing many small heads would require 150 screen in this size. A large poster head of 15 inches by 12 inches will look as fine in 40 screen as the same head made 5 inches by 4 inches in 120 screen. Generally speaking, fine screens render small details better than coarse screens, but the paper



Fig. 51A—Detail in small faces preserved in 150 screen.

surface must be considered too. There is little use in having the details beautifully preserved in a fine screen block if that block has to be printed on a rough writing paper. Figs. 51 and 51A show the same subject in 65 and in 150 screen.

PEN AND INK DRAWINGS.—Drawings for line blocks should be in black Indian ink on white Bristol board, or on any smooth white paper or card that will give a clean line without running or digging up the surface. They should, of course, be in proportion to the shape of the required block, and not more than three times larger.

AND HOW THEY ARE MADE

For ordinary work a very suitable proportion is double the length and breadth of the required block, and much good work is done same size, or only half as large again, as the block. To draw on a very large scale usually means that the artist puts in, at a great expenditure of time, delicate details which will not bear the reduction.

A very common fault is to put in lettering which may be quite clear in the drawing, but is hopelessly illegible when reduced to one-third or one-fourth.

Line-blocks can be made successfully from impressions of other line blocks or type, if in black on white paper.

The following table shows some other possibilities, but if a really good job is wanted it is usually better to redraw properly :—

<i>Original.</i>	<i>Copyable, if on</i>	<i>Uncopyable, if on</i>
Impressions in	White paper	Red
black, dark red,	Light pink	Green
dark green, dark	Light yellow	Yellow
yellow, or	Light green	Dark blue, or
orange.	Light blue	Brown paper

The colours given in column 3 can generally be reproduced on a colour sensitive plate at extra cost.

Impressions in blue, purple and violet are generally uncopyable, except on a colour sensitive plate.

Die press impressions do not make very good line blocks. There is often a rough edge on the impression, and reflections from the raised, glossy ink cause defects when photographed.

Litho impressions, if on rough writing paper, are usually very broken, and do not make good line blocks unless carefully touched up, which in extreme cases is as costly as to make a new drawing.

STIPPLES.—Stipples of various patterns can be laid down on any desired portion of a line block. To indicate to the blockmaker that a stipple is wanted the artist rubs a blue pencil *lightly* over the spaces on the drawing, indicating in words what sort of stipple he wants, such as “fine regular dot,” “coarse irregular dot,” “fine ruling,” “coarse ruling,” “dust grain,” etc., or giving

PRINTING BLOCKS

A FEW EXAMPLES OF
STIPPLES WHICH CAN
BE APPLIED TO ANY
PART OF A DRAWING.

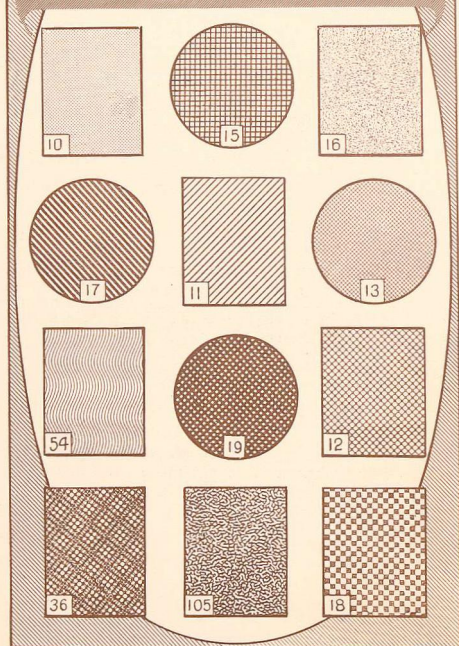


Fig. 52.

AND HOW THEY ARE MADE

the reference number in the stipple samples used by his blockmaker. (See Fig. 52).

The stipple must be suited to the class of printing the block has to undergo.

PROPORTION WHEN REDUCED.—To find what size and shape of block can be made from any original, lay a diagonal line from corner to corner of the photo or part

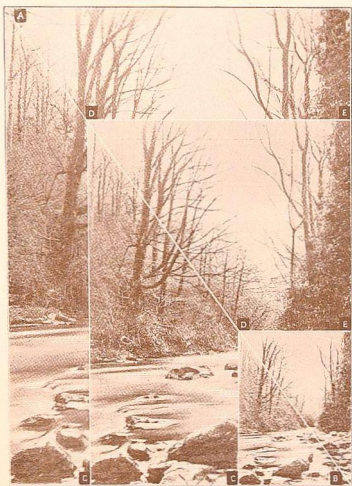


Fig. 53—Showing diagonal line method of finding proportions when reduced.

of the photo, as A to B (Fig. 53). Say the block is to be $2\frac{3}{4}$ inches top to bottom, measure this distance vertically from base to diagonal, as C to D. The horizontal line D to E gives the other dimension of the block.

PRINTING BLOCKS

The diagonal, extended beyond the photo, gives in a similar way the dimensions of the block that can be enlarged from the original.

“HALF SIZE” OR “HALF AREA.”—A rather frequent source of misunderstanding is the expression “half size.” Some people by this mean the *area* of the work, others

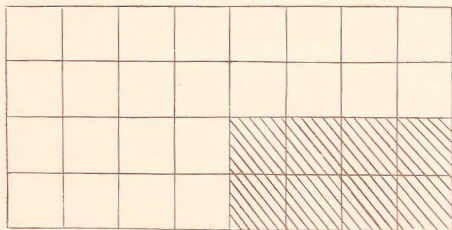


Fig. 54—“Half-size” or “Half-area.” The shaded part is half size lineal, and equals one quarter area.

refer to the *lineal* dimension. Fig. 54 shows that “half lineal” is equivalent to “quarter area.” A blockmaker always takes “half size” or “quarter size” to refer to the lineal measurement.



squared
plain



squared
lined



squared
double lined

Fig. 55—Three styles of finish :

AND HOW THEY ARE MADE

FINISH OF BLOCK.—In half-tone this is usually “squared up,” which is the cheapest finish. A fine black line is put around the block, unless ordered “plain edge.” Special borders can be engraved, such as two or more parallel lines, a broad grey tint border, etc. Ovals or circles can have the same varieties of finish as squared blocks. Some subjects look better “cut out,” that is, with the background of the object removed so that it



Fig. 56—Half-tone, 150 screen, vignetted.

stands out boldly against the white paper. A vignette means a gradual lightening of tone until it fades away imperceptibly into the white paper. It is not every subject that will suit this finish, and it requires great care in printing to get a good result. (See Figs. 55, 56, 57, and 58).

PRINTING BLOCKS

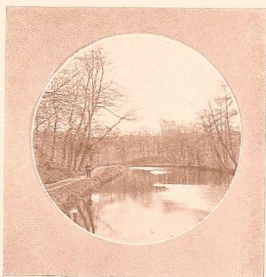


Fig. 57—Circle, with tint border squared.



Fig. 58—Half-tone, 150 screen,
“cut-out” background.

COMBINATION BLOCKS.—There are many kinds of combination blocks which give good effects, such as combined half-tone and line. In this a half-tone picture may be enclosed in a pen and ink line block border

AND HOW THEY ARE MADE

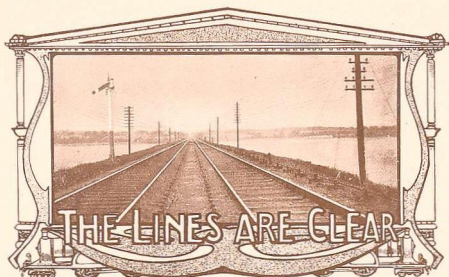


Fig. 59—Combined line border and half-tone on one piece of copper.

(Fig. 59), or part of the picture may be in half-tone and part in line.

“ Half-line ” work is used to give a grey shadowy

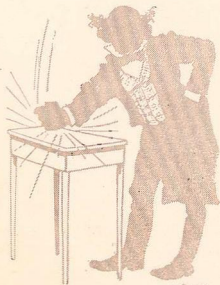


Fig. 60—" Half Line," 100 lines to inch.

effect, and consists in breaking up the lines of a pen and ink drawing into fine dashes or dots (Fig. 60). A combination of “ half-line ” border around a half-tone picture

PRINTING BLOCKS

is very effective (Fig. 61). "Half-line" can also be combined with ordinary line work to give a shadowy effect to part of the design (Fig. 62).

CLEARNESS IN ORDERING.—Here is the information a blockmaker needs before he can execute your order in the most economical way :

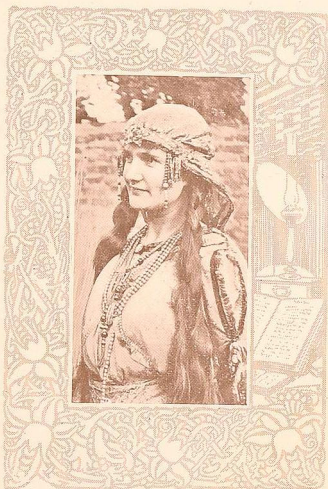


Fig. 61—Combined half-tone and "half-line" (100 screen dpt) on one piece of copper.

Size of block (preferably in inches).

Portion of photo or other original to be included in block.

Screen, lines per inch (or a sample of paper the block will be printed on).

Shape of block (whether squared, oval, or circle).

AND HOW THEY ARE MADE

Finish of block (whether line or plain edge, vignetted, or cut out background).

Whether mounted or unmounted. (City newspapers usually take blocks unmounted).

Are stereos or electros to be made from the block? (In this case the plates are usually left unmounted).

ECONOMIES.—Considerable economy can be effected by a little foresight in preparing originals and in ordering blocks. The blockmaker has a certain “minimum”



Fig. 62—Combined line and “half-line”
(65 lines to inch) on one piece of zinc.

size, below which the cost of production ceases to fall. In most classes of blocks this is placed at 14 square inches, say about $3\frac{1}{4}$ inches by $4\frac{1}{4}$ inches. If two or more *small* blocks can be copied together on one negative, they are charged on the total measurement, plus 6d. each subject for separating. In line blocks this often means that a number of small blocks handled together may work out at only a few shillings each, instead of the minimum charge for each block.

When drawings are being prepared, instruct the artist to draw each one in a definite scale to the block wanted. For instance, let him draw all to twice the width and twice the depth of the required block. All of the

PRINTING BLOCKS

sketches will then be copied in one batch, if small, and considerable saving to you may result.

I often get a batch of drawings for small blocks, every one of which requires a different amount of reduction, and costs full minimum price. A little care would have saved perhaps three or four shillings on each subject.

In conclusion, I would say: consult your blockmaker *before* having photos or sketches made for black and white, or more particularly, for colour work. There are many varieties of blocks and colour blocks, and he can advise you on the most suitable class of block and the best way of preparing the original, and probably save you both time and money.

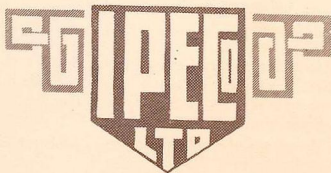
NOTE TO SECOND EDITION:—

This Edition has been re-set, and the illustrations have been re-arranged so that each falls adjacent to its descriptive matter. Several pictures have been remade in a clearer form and a more comprehensive selection of stipples has been shown.

Some correspondents have regretted the omission of Line work in colour and Three Colour Half-tone. I would remind them that a full explanation of these processes, with colour charts and examples in colour, would have greatly increased the cost of production.

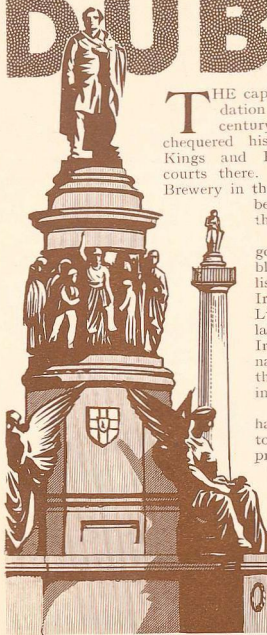
Dublin, 1932.

J. B. AIKIN.



AND HOW THEY ARE MADE

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