

## LESSON TWO

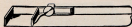
### THE PRINTER'S TOOLS AND HOW THEY ARE USED

#### Your Composing Stick

The basic tool of the printer is his composing stick. In it he sets his lines of type, and by means of it he gets all his lines exactly the same length, so that when he makes up his printing form and puts it in the press it will hang together.

While there are a number of different kinds of sticks, both with and without marked graduations on their bed, the most important thing is to set whatever kind of stick you own accurately before you start, and not alter it or let it become changed.

The best way to get the correct setting for your composing stick



Regular Job Stick



*Pica Stick for ease in setting even picas*  
is to use metal furniture, or 12 point quads, both of which can be depended upon for accuracy. For example, if you want to set a width of 12 picas, take metal furniture of that width and put it in the composing stick. Add to it a single thickness of paper. Then bring the knee, or ell shaped piece of the composing stick up against the furniture plus the paper and tighten it. If you prefer, use 12 point quads — 12 picas worth, in one, two or three em widths, to which add the paper. If your stick has the graduations all marked on it, and you know them to be accurate, you will not need to do anything but set up and tighten the knee. For wide measurements you can substitute a piece of cardboard for the paper.

The stick should be held in the left hand, as shown in the illustration. For ease in setting type a composing rule may be put in



Using a Composing Stick

the stick, which is a piece of steel, brass or other metal, type high, the same width as the matter being set, with projections or ears which hang over each end of the stick.



A Composing Rule

Sets of composing rules of various widths may be purchased, or you can make them out of brass rule yourself as the occasion arises. They make justifying or tightening lines easier, because they prevent the individual pieces of type from catching on those of the previous line. An ordinary piece of type high rule without notches will also serve for a composing rule.

The companion to the composing rule is the make-up, or hump-back rule, which is used in making up the form. It, too, is the same width as the matter, but has no ears. Instead, it projects far enough above the type height to make possible easy grasping when making up the type form, and facilitate pushing lines backward or forward.

Instructions for setting type will be found elsewhere.

### The Galley

One stickful of type very seldom makes the complete job, so it must be placed somewhere while the



*Galley*

rest of the type is being set. For this there are galleys; three sided trays as shown. Galleys are also useful for storing type forms for future use. They are made of steel in convenient sizes.

### The Line Gage

Since you are dealing in picas as well as inches, the ordinary ruler is not so marked as to be of much help. Consequently the printer has his own kind of ruler,



*Line Gage*

which is variously called a line gage, type gage, line measure, pica stick. It is shaped as shown, and usually has inches on one side, picas (12 pts.) and nonpareils (6 pts.) on the other. The line gage is handy for all sorts of work, and is, therefore, one of the printer's closest companions.

### The Bodkin

Bodkin and tweezers are usually coupled both in thought and in use. The bodkin is a sharp instrument similar to the carpenter's awl, which gets into tiny corners, shoves down protruding spaces, and in general serves as a tiny finger for the printer. Like the tweezers it must be used with care to prevent damaging the type face. Combination bodkins and tweezers (one on one end, the other on the other end) are available, the bodkin usually folding back when not in use.

### The Mallet and Two

#### Kinds of Planers

Information on taking proofs will be found elsewhere. The tools for making them are the mallet and a planer. The ordinary planer has a smooth wood surface, and



*Mallet*

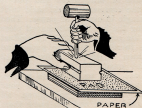


*Planer*



*Proof-taking Planer*

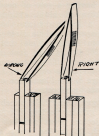
is made for lightly tapping over the type form to make sure that everything is properly levelled or planed. This same planer can be used for taking proofs by laying a piece of felt over the sheet of paper which has been placed over



the previously inked form. Special proof planers have felt bottoms so that they can be applied directly to the paper.

### Tweezers

Tweezers are useful for drawing out letters from a form, picking up type that is down in a cramped corner, pushing down spaces, and so forth. However, they can be very destructive, be-



*SHOWING HOW TO GRAB TYPE WITH  
TWEEZERS. TOO CLOSE TO FACE OF  
TYPE IS LIKELY TO DAMAGE IT IF  
TWEEZERS SLIP AND SNAP OFF.*

cause if they slip they will damage the type face.

### Lead, Rule and Slug Cutters

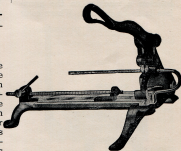
Leads, slugs and rule all are made in two foot strips, and while it is possible to purchase them in any measure, actual practice requires that the printer have some kind of device for cutting them himself when and as needed. For this there are a variety of cutters and saws, ranging from the simple lead cutter to expensive saws costing some hundreds of dollars.

More leverage is required to cut brass rule than leads, so that any cutter which will handle rule will handle leads, but not necessarily the reverse. The heavier and better the cutter, the more easily it will handle the thicker, tougher metal. However, even the best of lead and rule cutters is likely to put a tiny burr on rule, which will



*Lead Cutter*

require removing or straightening. Printers' metal saws will do better, but sufficient stock must be allowed when measuring lengths for the metal ground up by the saw into dust. They are, too, much more expensive, even the cheapest being several hundred dollars. Where a large volume of work is done saws will pay for themselves, but in the average small shop a rule and lead cutter will suffice. Leads, slugs or rules which require finishing at the ends



*Lead and Rule Cutter*

can be taken care of with a file or a stone. Even the sawed material will be a little better if it is rubbed over a fine file, a stone, or a piece of sand or emery paper.

Don't cut steel rule on a lead and rule cutter. File it apart, or use a hacksaw. Steel rule will ruin any cutter.

### Paper Cutters

Paper cutters require little elaboration, since for the average printer the question of the correct model is more one of size. Aside from the shear type trimmers they consist of guillotine style knives which come down on the clamped block of paper or cardboard with a sidewise motion. Such cutters have very accurate gages and will, if in good condition, do very close work. Aside



*Card and Paper Cutter*

from the press itself the largest expense facing the printer is for a paper cutter. Paper supply houses will cut to order, but for cutting the edges or trimming booklets a machine on the premises is to be desired. Where color



*Bench Paper Cutter*

register must be maintained an inaccurate cutter can cause a lot of trouble, so the printer, if he is trying to keep down his costs, must beware of second hand machines which look all right and whose price seems low, but which are too worn to keep within close tolerances.

### Punches, Drills, Perforators

Round holes are made in paper or cards in a number of different ways. Aside from slit perforations, which are made with brass or steel rule in the press, perforating similar to that used on postage stamps is turned out by machines having a row of needles in the form of blunt cylinders, which fit a lower die and blank out the paper. Various sizes are made, from hand models costing about \$150 to various foot and power machines. The needles are removable and replaceable. See Lesson 16, page 8, for illustration of a hand operated perforator.

For bigger round hole punching there is a greater variety of equipment. Ejector press punches — dies which fit in the press and punch as the work is printed — are the simplest. Next come the hand punches which very often



*Hand Punch with removable and adjustable dies.*

are made to give one or more common looseleaf combinations. A more flexible punch, much used by printers, is a hand lever or foot punch in which a number of dies may be assembled, spaced as required, size of hole depending on the dies used. The workhorses of the business are machines using hollow drills, often with hydraulic feed, which will handle a large bulk at a time, and which accommodates various sizes of drill. The discs of paper or cards



Center Binding

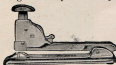


Side Binding

punched out travel up through the hollow drill and out; otherwise they'd jam in the drill and it would break. In fact they sometimes do, anyway. Hydraulic drills cost several hundred dollars or more, and like all equipment must be evaluated in the light of the work the printer has to do. Some need such equipment, others will find the various forms of punches more economical.

### Binders and Stitches

There are various staple binders and stitchers on the market, the simplest and most easily used being the kinds which employ strips of cohered staples of various lengths. Staples with prongs



A Binder

or legs as long as one-half inch are available, which can be used on thicknesses up to almost that much, allowing for clinching over of the leg on the other side. These machines are often provided with two kinds of table, a flat one for side binding, and a saddle for putting the staple through the center. Models are also made for foot power.

For larger volume of work the continuous wire stitcher is employed, which may be adjusted to different thicknesses, and which is made for foot or power operation.

Staple binders of good quality may be had for a few dollars; continuous wire stitchers cost several hundred dollars. Each has its



Long Reach Binder

place, and the printer must always consider the volume of a given kind of work in deciding which he will eventually need.

### Numbering Machines

Numbering machines fit in the chase along with the rest of the form, and provide the essential numbering which we find on many tickets, order forms, sales slips, etc.

Changing of the numbers is brought about by pressure when the press makes an impression. On most machines the part which causes this movement is the "No." preceding the figures. Some numbering machines have a removable slide which enables the printer to take off the "No." and replace it with a single letter or figures. Other machines are made for rotary and cylinder presses which are actuated by cams, levers, plungers, etc., but the so-called platen press variety is the one which interests us here; the kind used by the big majority of the job printers.

They may be purchased in a number of variations, to take care of different situations. Some number consecutively, that is, 1, 2, 3, etc. Others number consecutively backwards, 99, 98, 97, etc. Each



Numbering Machine

band of numbers is called a wheel, so that a machine which goes from 1 to 99999 is called a five wheel, or if it goes up to 999999 it is a six wheel.

Numbering machines can be taken completely apart for efficient cleaning. You can understand that this would be necessary, because with wheels or bands of numbers travelling around inside the machine, ink if allowed to remain and harden, would render it useless.

Since numbering machines may be easily taken apart, it is possible to change the number wheels with equal facility. For the printer who may be called on to run a job two or more up at a time, there are so-called skip wheels which may be used in place of the regular consecutively numbering wheels. Thus, one machine can be numbering 1, 3, 5, 7; and the other 2, 4, 6, 8, etc. or combinations which skip three, four or more. These skip wheels may be purchased separately and used in the numbering machine whenever desired, or the machines can be bought with skips instead of consecutive numbers.

Numbering machines are provided with what are called drop ciphers — that is, the wheels, when the cipher (0) is up, may be depressed. The first number on a five wheel machine would come out 00001 if the ciphers were not depressed. By pushing them down

below type height, they disappear and do not come up until they are needed.

While special numbering machines of all kinds can and are made to order by the manufacturers, it is well to remember that they are very expensive indeed, and work calling for them had best be left to specialists. Figures larger than  $7/32$ " high cannot even be used on an ordinary printing press because they are more than type high, and the bigger the figures the more over type high they are. Such characters require chase bed alterations, which are impractical and undesirable for the ordinary printer. Fortunately the overwhelming majority of jobs can be handled with ordinary numbering machines.

### Counters

Counters are devices for keeping a record of the number of impressions made. They should not be confused with numbering machines, which actually number the sheets or cards being printed.



The counter is placed on the press where it will keep track of the actual impressions, without recording incomplete movements, such as when the throw-off is engaged.

### Round Cornering Machines

There are various devices on the market available for round cornering paper or cardboard, in addition to which some hydraulic punches have accessories for round cornering. No special attention need be given them, as their use is plain enough. In addition, most paper and card supply dealers are able to offer round cornering service.

### Composing Machines

There are three different kinds of machines made to cast type, aside from those used by type foundries themselves. The first was and is the Linotype, which casts the line in one piece of metal, the characters, having first been set up on the keyboard by the operator. Similar machines are the Intertype and the Linograph (now defunct), all three names being trademarks for the respective companies making them.

A later comer, but widely used, is the Monotype, which casts individual letters. Two machines are used — one with a keyboard, on which a tape is punched with holes corresponding to the letters in the line. The other machine, the caster, takes the tape and manufactures actual lines of so-called monotype.

The third, the Ludlow, uses separate matrices which are set in a special composing stick. After the matrices are set, the stick is clamped in the machine, and the line cast. This device is used for large display lines.

Composing machines are wonderful and intricate equipment. Like paper cutters they must be in good condition and unworn to produce good results. Newspaper and book printers have them, and big printers need them, too, especially for body matter. Since good composing machines represent several thousand dollars' investment, the smaller printer usually finds it more economical to either use type or have body matter set by firms specializing in that kind of work.

### Mitering Machines

A good job of mitering (beveling the ends of rule so as to make a border or box) is a little bit of a trick, the amount of work depending on the equipment and the skill of the person working it.

There are rotary mitering machines on the market which use blades like a heavy wedge shape circular saw. Such machines are great time savers where much mitering must be done, but they entail an outlay of at least several hundred dollars.

Another is the ordinary mitering machine, which holds the rule in the regular upright position, and shaves off the end to the required angle. Care must be taken when both ends are to be mitered that sufficient stock is left for the operation.

### Quoins

The custom of using quoins or wedges in chases to hold the type is about as old as printing itself. Up to well into the present century it was possible to buy wooden quoins and "shooting sticks" which were used for wedging them in the chase.

Along the latter part of the nineteenth century there appeared several different kinds of patented



*Midget Quoin*



*Wickersham Quoin*



*Hempel Quoin and Key Wrench*

metal quoins. Among them was the Hempel, which uses the principle of the wedge, but improves on it, offering a key for tightening and loosening. The Hempel and variations of it are still among the most popular today.

Another later arrival was the Wickersham, which uses the cam, as a wedge, and Wickershams practically divide the field with various kinds of Hempels, for standard size work.

So-called midget or register quoins have a place for very close work, and also in forms where close register is important. A row of these register or midget quoins around a form enables the printer to make minute adjustments back and forth, tilting the form at will until it is correctly lined up. They are a screw quoin, using the same principle as Kelsey screw-type chases.

To keep your quoins in best condition, oil them occasionally. If you are using a chase or chases with very little paint on, wipe them over with an oily rag. Any iron or steel surface if exposed to the air has a tendency to rust and roughen unless it is taken care of. The various cleaners used by most printers have a tendency to cut the dirt (which is what they are intended to do), but in the operation they expose metal surfaces to the air, and rust is likely to form. Type and metal furniture (except cast iron furniture), being of non-ferrous metals, will not give any trouble in that regard, but all equipment of iron or steel should be watched and the surface protected against rust.

### Lesson Two—Questions

1. Describe the two kinds of planers and their uses.
2. What precaution should be taken when using either bodkin or tweezers?
3. In what ways may leads, slugs and rule be cut?
4. What should be done to rule after it is cut?
5. What are bodkins and tweezers used for?

## The Printer's DICTIONARY

**Asterisk**—A reference mark (\*) used to call attention to a footnote or reference at the bottom of the page. Furnished in fonts of

auxiliary characters, or separately at the extra letter price.

**Auxiliary characters** — Type characters which are not needed often enough in regular work so that it is worth while to have them

### AUXILIARY CHARACTERS

~ ~ ~ ~ ~ @ P b φ % † § † \*

in every font. They are usually put up in separate fonts, and one style is used with all kinds of type of the same point. We show here auxiliary characters which are most commonly in demand, and are therefore included in most fonts.

### B

**Back up**—To print the reverse side of a sheet already printed on one side.

**Bails**—Clamps on platen to hold tympan in place.

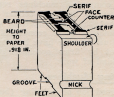
**Balance**—Proper arrangement of copy or type matter for good appearance.

**Bank**—Frame or rack with sloping top on which are placed galleys of type matter or forms. A blank case on an ordinary case stand can be used, although it is preferable to have no ends so that galleys may be slid on and off easily.

**Base**—The mounting for a printing plate at type height.

**Batter**—Damage to type or printing plate which makes portions lower than type high and consequently prevents satisfactory printing.

**Beard**—The slope of a piece of



Parts of printing type

type between the face and the shoulder.

(To be continued)