

CHAPTER XIV

MOLDS

MOLD LOCKING STUDS AND BLOCKS

MOLD BANKING BLOCKS

Types of Mold

HARDING and LOOMIS: There are three principal types of mold: universal, ad figure or advertising, and recess.

Universal: Cast solid slugs from 5-point to 14-point. Upper lips are thin. Watch the markings. Some will not clear the jaw on 14-point.

These molds are made with .0025" taper from top to bottom of the body of the slug, and taper also in the ribs, for easy ejection.

Advertising: Primarily to cast two-line figures. The ribs are wider and have no taper — that is, the slug, without trimming, is almost the same thickness from top to bottom. This makes it harder to eject, but these slugs, if untrimmed, will not bulge like universal slugs.

These usually are marked "5-12-point," and the lip is .028" thicker than universals. 14-point liners in these molds will damage the first elevator jaw.

Advertising figures larger than 18-point require a special mold. Ask your salesman.

Recess: Some cast as low as 10-point. It depends on the ribs. Some, to cast 24-point, have only 6 points space for the ejecter blade.

Linotypes require special liners for the left end. Intertypes use standard liners, but you must add the depth of the recess to the liner point size. Intertype recess caps can be moved horizontally to produce a rib at the left end of the slug. Newer Intertype recess molds have a "shelf" that fits in a hole in a regular liner. Intertype right-hand liners may be used in the left end to cast 30 picas.

Linotype old style recess molds have only nine ribs and cast a fairly thin lip on the slug. Newer molds have up to fifteen ribs and cast a thicker lip on the slug; therefore the left-hand liners are different on these two types.

What is the Proper Way to Clean Molds?

HARDING and LOOMIS: Wipe them daily with a rag in front, and scrape with a piece of brass rule. There should be no metal on the back. See *What Do You Use on Mold Wipers?* page 142.

Mold polish definitely abrades a mold. Do not use it unless necessary. A mixture of graphite and oil will do most jobs. Graphite and castor oil is good, but castor oil leaves a gum. Use a piece of 6-point reglet to rub the inner surfaces of the mold with graphite and lubricating oil. Some molds never need this. Some need it fairly often—once a week, say. Some recess molds need it especially. On these you will have to use a match or similar instrument to rub the recesses. In rubbing, keep it up until you feel the roughness go away, and the stick slides over the steel. It doesn't take too long.

But don't polish the molds at all unless you have trouble with ejection. It has been found that the apparently rough coating of gray oxide on a mold actually helps ejection.

How Often Do You Take Off a Mold for Cleaning?

QUESTION: I have been taking the molds off the machine for cleaning once a month. The foreman says I should do it every week. What is the correct procedure?—I.L.S., Monongahela, Pa.

LOOMIS: This is the question I have been waiting for. *Do not take off the molds for any purpose whatsoever except repair.* They can be cleaned on the machine. Squirts can be cleaned up without removing a mold. You get a mold on the machine and get the knives set to it and it will run for years, but if you constantly take off and put on the molds you probably will constantly be fiddling with the knives. This more particularly applies to molds that are shimmed. *Leave those molds where they are!*

How to Remove a Mold for Repair

Loosen the liner screws, then take out the four screws *in line* on the front of the mold. With a rag, hold onto the mold as you take out the last screw.

Do not loosen the other two screws. They hold the mold keeper plate. If you do loosen them by error, push the plate up to the top and tighten the screws. If your lines do not come at the right place on the slug, send the mold to the factory.

While the mold is off, lay a straight-edge across the cap and body when they are together, to determine if the cap is aligned with the body of the mold.

How to Tell if a Mold Is Warped

LOOMIS: I am very dubious that an untrained man can with a straight-edge determine if a mold is warped unless it is very bad — say .003" to .005". I have had machine shop training and considerable machine shop experience during the war, and I doubt that even a trained man can determine .0015" of warp, which is the most I have ever seen in a report from the Company. This is not done with a straight-edge, but most likely with a dial indicator — and those can be tricky where that small dimension is involved. Since working in a machine shop, I have quit taking the responsibility for this decision.

As for warping, it is invariably the cap that is warped. However, either cap or body may be *worn down* considerably on the short end (front to back). This can be measured with a micrometer. Anything less than .873" may be considered defective. I have seen them down to .856" in spots — a path worn by repeated applications of mold polish to the back wiper.

Straightening the Mold Posts

HARDING: There are three ways:

1. Send the mold in to the Company.
2. Put the mold and cap into a vise, with brass to protect it from the jaws, and an extra 2 points behind the body and in front of the cap, or vice versa, and squeeze into alignment.
3. Take out the posts and hammer them straight. This is difficult, for they are held by tiny pins. Also, they are fairly hard and may break, as they may in the vise treatment. With a broken post, you can use the mold, but you'd better get a new post as fast as possible.

To Remove an Intertype Mold

HARDING: Remove cap and liners, then the four screws.

How to Seat a Mold in Replacing

LOOMIS: The same procedure applies to Linotype and Intertype. Clean the mold pocket thoroughly, as also the mold. Place in position and to the right. Tighten the four screws, then the three in the cap (or two, if Intertype). Then loosen four, tighten four. Loosen three, tighten three. This is as near as you can get to an identical seating every time.

Use only screwdrivers with good blades, unground by you. Work from the center screws out.

Changing Liners

HARDING: Make it a habit to clean out the flakes of old metal when you change liners. Scrape the spots off the liners with brass. Start a liner in, then bring the center screw down lightly, and tap the liner the rest of the way.

This will push out the loose metal to some extent.

When Mold Cap Screws Won't Hold

HARDING: In the first place, use good screws; in the second place, use a good screwdriver with a blade that will go down into the hole without reaming out the threads. Set all screws firmly but not desperately, or you will have a cracked disk.

If new screws will not work, you can get a 16x24 tap and screws to match from Wm. Reid & Co., 2271 Clybourne Ave., Chicago. No drilling is necessary. Just tap.

LOOMIS: Since the war I have known m-o's to have trouble getting this tap. In such a case, drill out the hole with a size F drill (or $\frac{1}{4}$ ", which is a few thousandths smaller) and tap with a 5/16x18 tap, which can be had at any hardware, also screws or bolts to match. You will have to saw off the bolt and make a slot with the saw, and it leaves a very thin edge at the front of the disk, but these seem to last indefinitely.

Why Are Nibs Knocked off Liners?

HARDING: Invariably this is due to up-and-down play in the ejector — generally on the old style solid blade.

Can Bent Liners Be Repaired?

LOOMIS: Yes, if the liner is only sprung and if you will use care. File off the crunched-up part of the rib so it will fit in the groove in the mold. Turn the liner upside down, with the slot away from you. Now file a little on the right side of the bottom of the rib. Do this until the liner will fit flush with the mold. And by the way, order a couple of new liners — one to be hidden in reserve.

HARDING: A slightly sprung liner will develop a low spot near the end, where it is constantly pushed back by the jaw, if you don't do something about it.

Why Are Slugs out of Square?

QUESTION: We have set and re-set the knives, but still our slugs are out of square. They bow up at the top, and a column of type has to have strips of cardboard dropped in before it will print. The floorman is yelling his head off. — S.A.S., Caledonia, Okla.

LOOMIS: This baby is my meat. I spent eight hours finding out what was the matter, and four hours more fixing it. If I had to do it again, I would tell them to order new molds — for this was the roughest work I've ever done.

The molds, hit many hundreds of times over the years by a heavy hand on the ejector lever, were out of square. The right-hand knife cut off too much rib. I finally laid the molds on stereotype casts, and with other pieces of cast to absorb the shock, punished those molds with a one-pound hammer. It was hard work and long work — but I got them square. I don't think it was worth it — but I was up against a press-day, and I do not like to go away from a job unfinished.

This could happen to you. It is shown by the fact that the left-hand knife does not touch the bottom of the slug, while the ribs measure to a definite taper. I advise new molds. Repair is a heroic measure.

Replacing the Mold Disk Locking Studs and Blocks

HARDING and LOOMIS: The studs should be oiled once a week. Grease collects chips of metal. It is easy to see when they are worn, for the ends look rounded and sometimes actually broken. Harding says to run the disk onto the blocks and try to pry up the disk with a heavy screwdriver in the teeth. If the disk moves, the studs and blocks are worn.

Necessity for replacement may be indicated by inability to hold a constant perfect trim.

New studs measure .350", but measurements are deceptive, for the studs do not go all the way into the blocks.

Order four studs, four keepers, and four screws, and at least the right-hand block. On old machines the left-hand block is solid; on newer machines it has a little movement and so does not often wear.

Install the studs and tighten them firmly.

On an old machine, see that the gib under the mold slide allows free play (.006" to .007" — or back off the screws $\frac{1}{4}$ turn after tightening them). Set the mold disk guide support screw as instructed in *Setting the Mold Disk Guide Support Screw*, page 128.

Remove the knife block. Install the new stud blocks. Do not put the dowel pins in the blocks, and do not fully tighten the bolts that hold them.

Back the machine with a 30-pica mold in ejection position. Push the ejector lever forward with a perfect 30-pica blade in it.

Now you want to secure about .002" clearance between the flat side of the mold and the ejector blade from top to bottom. This may take patience. Tap the right-hand stud block up or down. Test with a feeler. Sometimes you can

get .004". Whatever it is, *there must be clearance*, or the ejector blade will score the mold. When you get it, tighten the bolts firmly and test again. If still right, turn the machine to normal and open the vise. Let us hope you have blocks with soft ends; most of them are now.

The dowels are $\frac{3}{16}$ ". For this job you will need a straight reamer of that size and use cutting oil. Drill the holes in the opposite corners from the old ones (you can also drill the old ones bigger, but this can be tricky) with a No. 14 drill (.182"), or a $\frac{11}{64}$ " if the numbered drill is hard to find. Ream the holes with cutting oil to avoid getting them too big. Put the pins in and pray.

Try it again. If you have not moved the blocks, you will still have clearance between the mold and the ejector blade. If not, set the block again and go to $\frac{7}{32}$ " or $\frac{1}{4}$ " dowels. If you get a block with hardened ends, you're a dead duck. You can do nothing but use the old dowel holes and hope they test out all right. Sometimes they do.

We didn't tell you before, but proper installation of mold disk locking studs and blocks is as ticklish a job as there is on a linecasting machine.

The question has come up: can we use a $\frac{3}{16}$ " drill? The answer is: almost never, for the reason that a drill not sharpened with the point exactly in the center will cut a hole larger than $\frac{3}{16}$ " — and very few drills, even new ones, are that accurate. Experienced machine shop men never use a drill of the size they want, if the fit is close, as a dowel pin fit should be. There is another way out, however. You can drill the first hole with, say a $\frac{1}{8}$ " drill; and then, with a $\frac{3}{16}$ " drill in good shape, that mikes not over .1875", re-drill the hole. This way you avoid the off-center effect. Cutting oil will make the hole cut a little small in the cast iron of the frame, which should come out with a nice tight fit.

You can now check the first elevator jaws for parallelism with the molds, as explained in *Misalignment of Mats, etc.*, page 109.

Special acknowledgement is here made for advice from Harry Pottle of W.N.U., Chicago; Walter Severin of Intertype Corporation; W. J. Mulroy of the Mergenthaler Company; and to the veteran, George Cornell of Mergenthaler, who died a few years ago. Few have set more stud blocks than George Cornell.

When Do You Replace the Mold Disk Banking Blocks?

LOOMIS: There is no adjustment on these (two on a Linotype, three on an Intertype) (but see below). I replace one when it is worn down about .015". The one Linotype block that I have available measures .940" at the high point; this is just over $\frac{15}{16}$ ", and, as I recall, this is the original measurement.

HARDING: The mold must not bank on these blocks at casting point, for that would interfere with the lockup. Test with red lead or a strip of paper. They do bank there at ejection, to act as a buffer for the breaking loose of the slug from the mold.

These banking blocks are located above and below the side knives. The Intertype has a third block in the middle. This is adjustable. Set it so that a strip of paper may be drawn from between the mold and banking block at the cast.

Snow on Molds and Under Distributor Box

QUESTION: We have far too much metal gathering on the fronts of the molds. It is carried up also by the mats and falls in a veritable snow under the distributor box. — R.B.G., Horseheads, N. Y.

H. C. ROCKWELL in the *Graphic Arts Monthly*: This has its fundamental root in a lack of proper lockup. It may come from a warped mold, though not too often. It may be caused by spacebands in backward, rounded vise jaw corners, badly worn molds, mold caps pushed back out of line, a loose tie-bolt in the back, vise locking screws that work loose, mats with badly crushed side walls — all are causes.

Check the forward thrust of the mold disk, parallelism of jaws with molds, failure of the mold disk to relax between justifications. The pump stop should be positive in operation to prevent loose lines' casting. Keep spacebands clear and polished.

HARDING: A good front mold wiper helps. A broken pot lever spring contributes to the trouble. See that the pot retreats after the first lockup. Sprung mold posts will allow it, and a loose mold screw will hold the mold from the vise jaw. Spacebands are made thicker at the front by .0005" (one half a thousandth).

LOOMIS: I have found in many cases on old machines that "slop" in the forward thrust of the mold disk was responsible. This is especially noticeable on Intertypes, and they are particularly amenable to correction. See *Too Much Forward-and-Back Play in the Mold Slide*, page 126.

Will Floor Wax Help?

LOOMIS: As I write this, there has recently developed the idea of using Simoniz floor wax on the face of a mold and on the jaws to prevent accumulation of metal. I have been using this for about a year, and it certainly does retard the accumulation of metal on the molds, though it should not be expected to take the place of worn parts entirely. I am putting new cam rolls and eccentric pin in my machine, having last night found them far below my own prescribed tolerances.

Vibration in Mold Disk As It Goes Onto the Locking Stud Blocks

HARDING: May result from:

1. Screw in the square block (back of the bevel gear) loose.
2. A mold turning gear segment loose.
3. Clamping screws for the shoes are loose.
4. Mold driving brake is loose.

Why Does the Disk Vibrate As It Revolves?

LOOMIS: Lack of oil on the mold disk stud or too close a setting of the mold disk guide or guides. Check the guides. Try penetrating oil on the stud.

Oiling the Mold Slide

LOOMIS: The V slots, both top and bottom, in which the mold slide works, need oil. Normally this comes through an oil cup about half-way back, but on a lot of older Linotypes, although the boss is there, the cup is not. You now have the fun of drilling a hole. Take out the mold slide. Get a $\frac{1}{4}$ " drill welded onto a foot of $\frac{1}{4}$ " rod, and try to hit the apex of the V. Once the hole is there, remember to oil it.

Warping of Molds

Note: By all means do not fasten a gas torch under the mouthpiece and leave it there. This warps or cracks more disks than anything known. Do not leave a mold locked up on the cast. Molds are not designed for continuous heat of that temperature.

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