

CHAPTER IX
FIRST ELEVATOR JAWS
THE FIRST ELEVATOR

Duplex Rail Levers

LOOMIS: On a Linotype, if the duplex rail levers are worn flat at the place where they hit on the blocks above, replace them. See that the springs have tension in any position. Observe whether the lugs on the duplex rail are flush with the surface of the front jaw. If they are standing out, it probably means dirt and gum. Usually they are a little sunken, which means you will have to put new stop pins in the duplex rail, for you will find the old ones flattened on one side.

Duplex Rail Is Too Loose

Take off the duplex rail cap underneath the front jaw. (Remember, the front jaw is the one toward you.) Also, it is easier to work on the duplex rail with the vise lowered to second position. Wash the cap, the duplex rail, and the surface of the jaw with gasoline, then rub with graphite. A toothbrush is good for washing; the fingertips are good for graphiting. Hold the duplex rail against a straight-edge and be sure it is straight in every direction. If bent, as it can be from a double-black lockup, it will give much trouble. Put it back and try it. It must work freely. But maybe it works too freely. See if it wiggles up and down. There should barely be perceptible motion. In the rare cases where excess motion occurs, a new rail should be gotten. If there is still slop, you will have to file off — but *carefully and squarely*, with the file held flat all the way across — the tops of the projections to let the cap down a little.

Duplex Rail Sticks

Suppose the rail sticks — which is far more likely. Loosen one of the cap screws and try again. If it isn't that one, tighten it and try another. It may be all. Take off the cap and use a prick punch to drive up little mounds of metal; use the punch sidewise. It won't require much. Try the rail again. If it doesn't work freely, test it again for straightness. If it is now loose, tap the little mounds with a small hammer and tighten up the cap again. You can use paper shims, but I prefer punching, though it smacks of butchery, because shims get lost and you have the job to do all over again.

Test the Jaws With a New Thick Mat

Now we have the cap on; the duplex rail is working smoothly and seats itself flush with the surface of the front jaw. Take a little-used thick pi mat and try it the full length of the jaws, in both upper and lower positions. If there are nicks, smooth them out cautiously with a file. Sometimes there is metal around the big screw heads which would interfere with the spacebands; clean it out.

First Elevator Jaw Adjusting Bar

How about the adjusting bar — the flat plate held by five screws through the front jaw? Does it have a groove on the top edge? You can reverse it if you hone a bevel on the other end, but I suggest a new one. Fewer complications. When you install the new one, try your mat both up and down. You may have to pin punch lightly the edge immediately below the bar to raise it a little to avoid binding the toes of mats in upper position — especially true if the duplex rail is battered.

HARDING: Do not reverse the adjusting bar. I have found a difference in the top and bottom edges.

Adjusting the Back Jaw

Now you find the two jaws are not parallel. They are wider at the right end. But wait! Wiggle the mat and decide whether the wideness comes only at the narrow part of the mat, where the projecting edge of the back jaw fits just under the mat's ear, or is it general and about the same across the ears also?

Let's assume it is only the thin rail, because that works out better for this explanation. Incidentally, try a straight-edge on the back side of the back jaw. If it is bent, run for a new one. Try the straight-edge along the thin rail. Here you usually find considerable wear on the right end. If this is only for a couple of picas, that won't matter, but inside the pawls it isn't good, because it allows the end mat to fall off or jump up and get smashed.

Let's say we're going to put on a new one. The procedure is the same as for an old one. Pull up the two screws. (On a Linotype, the shorter screw goes on the right.) Try your mat now. Try it first on the left end. Is it free? If it binds a little there, take off the jaw and use a prick punch both above and below the ridge on the separating block. Try it again. Get it right. Now for the right end. Is it loose? Lift the vise into the first position and let it fall back against your—er, shall we say guts? Supported thusly, you may now tap the end of the back jaw with a rawhide hammer, or with a plain hammer against a wooden block. It won't take much. Keep testing until you have it as close as it will go and not bind at all on the mat. It is well to note here that if those lugs are sunken on the front side of the front jaw and you didn't fix them as we

told you, the duplex rail will now protrude too far toward the back of the machine and confuse the issue very much indeed. (See above, *Duplex Rail Levers*, about putting in new stop pins.) Be sure the mat is not binding against the duplex rail.

Now suppose you get the back jaw in a teensy bit too far. Slide a round piece of wood, $\frac{3}{8}$ " or $\frac{3}{4}$ " in diameter, between the jaws, and pry out a little—*gently*. With a little care you can get a good adjustment this way, and if you don't soften up the jaw by too much bending, it will stay.

Is the Back Jaw at the Same Height as the Front Jaw?

A small square is the easiest way to tell. Otherwise use a piece of brass rule laid edgewise across the top of the front jaw. By holding it there, you can tell if the back jaw is high or just right. If high or low, take it off and peen the ridge on the separating block on one corner to bring it up or down (peen on the right end). It can be necessary to file off the opposite corner, but I do not like to get mixed up in this, for it is always hard to hold the back jaw in position once you have mangled the block. However, watch the right end, for it has to fit close to the line delivery rails. The two jaws must be level across the top and they must also be even at the ends.

This jaw business can be very tricky. When you get them so the mats travel free without binding and without sloppiness, with the jaws parallel, square on top, and even on the end, you get a bluebird.

First Elevator Jaw Spring Pawls

LOOMIS: I do not like these as stiff as they come from the factory. I grind out some from the middle so they have about half the original tension. Remember, the slotted one goes in the front jaw, and you have only to loosen the two screws and slide the pawl under the plate. An Intertype has a triangular piece pushed by a similar flat spring. The front jaw also has a small cylindrical piece as a filler. These triangular pieces get their corners worn and have to be rotated. The best way to get the one back in the front jaw is to lay the machine over on its back, but if that isn't feasible, use the stiffest cup grease you have and stick the triangular piece on the end of the cylindrical piece. It takes patience.

Tension of the spring pawls must be equal. Do not have one stronger than the other.

The Line Stop

The first elevator jaw line stop's importance will be recognized if it acts up. It should be square—that is, each side should be straight up and down, and the ends at the same level. Spread it about half an inch on the open end, and graphite with the fingers. If you have an automatic line stop pusher-backer, you won't need that much spread.

Adjustments of the First Elevator

HARDING and LOOMIS: These are not many.

1. The seating adjustment, made by the large screw closest to the front jaw. Run in a long line of caps and allow the mold to come forward. No spacebands. Stop the machine. You should be able to lift the elevator .010". On old machines we said $1/64$ " and sometimes took $1/16$ ", but if our mats were not old already they soon would be. On newer machines, especially with quadder and two-letter display equipment, the .010" setting must not be exceeded. When you lift the elevator, you should be able to slide an .008" feeler under the screw, but not .012". Remember, *there must be some rise of the first elevator after it seats itself.*

2. The vise automatic. Use the smaller screw. When the elevator is fully seated, this screw should strike the top of the vise automatic rod just enough so the dog will clear the lip down below.

HARDING: On quadding and low-slug machines, the adjustment of the vise automatic must be made very closely.

The first rough adjustment of the vise automatic is made with the first elevator resting on the vise cap. Set the screw so the lip on the stop rod barely clears the lip on the dog. Then turn the screw down about one half turn and test with a two-point lead or brass rule under the seating screw (*not* on the stop rod). The machine should stop on two points — not on one.

3. Using the large bolt in the first elevator auxiliary lever just under the first elevator cam, adjust the jaws for height. The recommended height is about .005" below the corresponding tracks in the line delivery rails.

First Elevator Connecting Link

HARDING: These are practically the same on Linotype and Intertype, except that on Linotype the spring is at the bottom, while on Intertype it is at the top. Also, the measurements differ.

The plain eyebolt has a left-hand thread. The one with the spring has a right-hand thread. Prop the elevator up with a 40-pica piece of wood furniture under the head, and remove the link. Examine wingpin and small shaft. If they are worn they should be replaced. If the holes in the eyebolts are worn, they also should be replaced. On an old machine, it sometimes saves trouble with alignment to put in a new spring. The notched end of the barrel unscrews.

Now, with the link in your hands, adjust it. From the closest edge of the plain eyebolt to the edge of the barrel should be $3/4$ "; the measurement at the spring end is $13/16$ ". This is for Linotype. For Intertype, make it $7/8$ " on the spring end, $5/8$ " on the plain end. Put the link back on and make the No. 3 adjustment described above. You can turn the barrel a couple of notches if

necessary to get a finer adjustment. Newer links have a lock nut to hold the dimensions given, but older ones do not. If you see that the spring is not functioning, dig out the corners of the notches a little with a three-cornered file, and the spring will hold the adjustment.

The first elevator auxiliary lever screw is the principal means of adjusting the elevator jaws with the line delivery rails. Do not use more than three notches on the link to supplement this adjustment.

The Gibs

LOOMIS: Not a complicated subject but a confusing one if you don't start right. On newer machines the right-hand gibs are doweled, and this simplifies the problem. On older machines you will have to start with them. The first elevator should move up and down perpendicular to the face plate, just missing the line delivery channel and the transfer channel. See that the line delivery rails are not extending past the channel castings to the left. Disconnect the first elevator link. Try the first elevator up and down, holding your knee against it to keep it against the right-hand gibs. I know of no simple way of measuring this. With the gib screws just snug, you tap the gib this way and that to get the elevator straight up and down (missing the channels by an equal distance), and with the proper clearance. Moving the lower gib will take care of the parallelism; the upper gib is largely the positioner. If the jaws miss the delivery channel too far, and you can't seem to bring it closer without canting the first elevator, use the delivery channel rails to close the gap. There is no such adjustment at transfer.

When this adjustment seems correct, tighten the screws firmly. Now take the upper left gib and bring it up snugly. Raise the elevator and allow it to fall slowly by its own weight. It should bind a little. With a linotype slug and hammer give the left gib one tap on the higher surface to drive it back a few thousandths of an inch. When the elevator is clear all the way up and down, tighten firmly.

The lower left gib is the easy one. Set it so the bottom of the first elevator has side play up to $1/16"$. This is necessary for alignment of the first elevator jaws with the molds—about which more later.

Run the machine a week. If the setting is satisfactory, I suggest you dowel the right-hand gibs. If you keep a little oil on the slides, you will not have to move those gibs again in your lifetime.

NOTE: Final clearance between the first elevator jaws (be sure they are even on the end) and delivery channel, also transfer channel, should be $.005"$ or less. Too much at the delivery channel will cause trouble with mats going into the jaws; too much at transfer will make trouble with the ears of the spacebands.

Black-Face Flipper (First Elevator Filling Piece)

HARDING: The flipper is made primarily for use with head-letter molds, which, if properly equipped with safety stop, will cause a vise automatic stop if the flipper is not used.

Double-Black Squirts

LOOMIS: The other principal use of the flipper is on double-black squirts. No instructions are needed for this. We all get them occasionally. But old-time operators would not use the flipper for ordinary bold face, preferring to use the duplex rail in the assembling elevator.

Double-black squirts take time to clean up, and they also frequently ruin a lot of mats. We heartily recommend the Auxiliary Line Safety, which will protect you from carelessness. We do not find it so listed in *The Book*, but if you order it assembled and give the model of your machine, you likely will get all the parts. The Companies are very helpful in things like this.

Misalignment of Mats Caused by Lack of Parallelism of Front Jaw

QUESTION: We have been having trouble with matrix alignment, as you can see from the slug. I have put on a good many parts, with no improvement. — D. M. G., O'Brien, Fla.

HARDING: Your sample slug shows the first elevator jaws out of parallel with the mold. The mats at the right take all the alignment upthrust, while the letters at left are so low in relation to the mold that the tops of the capitals actually overhang the slug and are trimmed off.

It takes careful work to correct this. First, see that mold locking studs and stud blocks are in good shape; the disk should not rise with the upthrust of the justification block. (**LOOMIS:** Some correction may be secured for non-parallelism by adjusting the gib, but I prefer to use the gib for the delivery and transfer channels, and proceed with Harding on this subject.)

Turn the machine over with a line in the jaws, and watch two things: a visible rise of the first elevator in justifications (this latter insures relaxing of the mold disk if the disk is properly set. See *Mold Disk Lockup Test*, page 124.) These last items being correct, get two fairly thick pi mats that show no wear. Open the vise jaw to 30 picas. Put one pi mat at each end of the first elevator jaws. With the clutch, drop the first elevator and shut off the power just after the mold disk moves forward, before the pot advances.

Turn off the motor. Now with a large screwdriver pry up the first elevator head as far as it will come (about .010"). Be sure you don't bend the flipper rod. Try the two mats. They should both be tight against the aligning rail of the mold. The play in the lower gibs helps to secure this. But perhaps one mat is tight and the other loose. That is what produces your alignment difficulty.

To correct it, first try to loosen the two big screws that hold the front jaw to the first elevator without taking off the back jaw. Sometimes you can; sometimes you can't. Turn them back snug, not tight. Pry up again. If the unevenness prevails, take steps. Let's say the left end mat is tight. Use a rawhide mallet and tap down on the left end of the front jaw only — not the back jaw, or you will have all kinds of complications. Usually you can do it this way. If so, tighten the screws and test again. If not, you can take off the entire jaw and work on the front jaw key, a flat plate that controls this. By dressing off one corner and using a small sharp chisel to spread the opposite corner, you can get whatever you want — but *be very cautious*, and don't go into this unless necessary.

LOOMIS: This adjustment can be made separately, but if there is too much difficulty it may have to be preceded by *Setting the Mold Disk Guide Support Screw*, page 128. If the studs are badly worn, this may happen.

Trouble in Adjusting Height of First Elevator

QUESTION: I have had the connecting link off and set it according to The Book; I set the first elevator back at the auxiliary lever, and I used the link for finer adjusting, but I cannot get the jaws to line up with the delivery channel. — T. D. R., Bedford, Ind.

LOOMIS: First let us assume the delivery channel is set as narrow as can be and still give the mats freedom to move. Then the channel must be aligned with the jaws from front to back. Likewise vertically — and this may be your trouble. If either the line delivery rails are not the same height with each other, or the elevator jaws are not the same height, there will be trouble. Both should be squared, as outlined above in this chapter.

If your mats should show a slight mark at the left edge on the index side, near the bottom, your duplex rail is projecting. This also has been covered in this chapter.

A loose duplex rail cap, permitting the duplex rail to sag, will cause much trouble and frequent squabbled lines.

First Elevator Seats Jerkily

QUESTION: On our Model 14, No. 19114, the first elevator descends too hard into the vise jaws, and seats with a bang. We have new parts, and the slides are well lubricated. Can you suggest a remedy? — L. F. S., Holden, Utah.

HARDING in the *Graphic Arts Monthly*: One of the most common causes is the old style knife wiper. When it gets badly worn, it falls to the right and bumps the controlling lever bracket on the way up; this jars the first elevator. You will need a new Knife Wiper Lever and Bracket. The old ones can be bent into shape, but it takes some doing.

Also, the lugs on the duplex rail may project just enough to cause a bounce.

Sometimes the back jaw is sprung so that it hits on the jaw guard at the right end.

If the long finger has a flat, curved spring, see that the mats are not catching on the rivets.

Be sure the first elevator cam roll is turning.

From its lowest position, lift the first elevator up and down by hand, feeling for the obstruction.

What Makes the Clutch Crack When the First Elevator Goes Down?

LOOMIS: Anything that interferes just slightly with the seating of the first elevator. If the interference is more, the machine will be stopped by the vise automatic. First, be sure the vise automatic is set to stop on two points but not on one. Look for a screw worked out of the first elevator jaw duplex rail cap. Look for metal piled up under the first elevator lever.

Very often these last two causes stop the machine cold at casting position.

First Elevator Jumps After the Cast

QUESTION: The first elevator jumps upward out of the vise jaws instead of rising smoothly. Please tell me what to do. — S. Y., Wellington, Tex.

LOOMIS: This is a serious condition that needs correction at once. Your vise-closing apparatus is not functioning. Whether a screw or a tapered wedge, it should open up after the cast; otherwise the first elevator has to jerk out a line that is firmly wedged between the vise jaws. See *Letters Hang Over at End of Line*, page 120.

First Elevator Jiggles

QUESTION: The first elevator jiggles on coming down to normal position, sometimes enough to interfere with mats coming into the jaws. By pulling up the gibs I can help it some, but the minute I oil the slide it jiggles again. — A. N. D., Emporia, Kan.

HARDING: This can be mean. The first thing to check is the first elevator cam; both it and the roll should be smooth and true.

The first elevator slide must slide freely.

The arc of the first elevator cam on which the roll rests at normal position should be true and not cause any vertical movement of the first elevator; try it by hand.

Often there is a bind at the transfer position which holds up the first elevator momentarily and then lets it slip away so that the cam roll bounces on the cam. The natural elasticity of the cast iron first elevator lever will create a jiggle. This could result from over-strong duplex rail lever springs, from lack of grease on the levers where they contact the operating blocks, or from a bad setting of the first elevator "head" (first elevator slide guide, officially) which forces the front first elevator jaw against the intermediate bar.

This might also result from misalignment of the first elevator which allows it to rub hard against the transfer channel.

It also happens that a badly worn driving gear pinion can magnify other deficiencies and increase the jiggle.

Mats at End Jump Out of Line in Recasting

QUESTION: On our Intertype, especially on recasting, a mat jumps out of the line just when the elevator nears the casting position. We've put in new parts but it has not helped. — C. A. C., Virginia City, Mont.

LOOMIS: See that the triangular detents present unworn corners to the mats. Equalize the springs. Sometimes they may need stiffening, but not usually.

First elevator jaws must not be sloppy.

On a 30-pica line, watch the transfer finger. It may push the end mat past the detent.

Delivery slide must deliver mats inside the detents.

Mat Jumps Up in Middle of the Line

QUESTION: I have been recasting a form, and at intervals a mat will jump up in the very middle of the line and try to get in the bold-face position. Either the mat gets chewed up or the machine squirts, or both. It beats me. — S. Y., Pawnee City, Neb.

LOOMIS: I think this results from a poorly fitted back jaw or a badly worn or sprung duplex rail, or both together. If it happens at the same place every time, you will find a scored place on the back jaw that will allow a mat to work part way up. There is some jolt to a recast, especially if it happens to be partly a bold-face line, but this will throw mats out of their proper grooves only if the back jaw is loose and inadequate.

Mold Cap Strikes First Elevator Jaw at Lockup

QUESTION: We have this difficulty when using 14-point liners only. Why is it? — A. A. M., Pattonville, Tex.

HARDING: This occurs only when 14-point liners are used in an ad figure mold, which has a thicker lip. The mold is marked "5-12 point," and means what it says.

First Elevator Cuts a Groove in the Face Plate

QUESTION: For a long time now our first elevator back jaw has been cutting a groove in the face plate, right across the delivery slide. Does this hurt anything?—M. O. T., Pendleton, Ore.

LOOMIS: Perhaps not now, but eventually it will. This is due to wear in the vise cap facing, a steel plate between the two upper first elevator gibs. This plate provides a sliding surface at this point, and since it is steel against cast iron, the steel wears first. I have tried shimming these but have enjoyed mostly trouble from it. If you have it ground smooth you can shim as much as .005", but it's cheaper in the long run to get a new one.

On machines with the open-type elevator you can see the middle screw of this plate when the elevator is at transfer. There is no such plate between the gibs at the bottom. Disconnect the first elevator link, take off both the left-hand gibs, and remove the first elevator. Install the new plate.

Unless there is unusual wear in the first elevator itself, this will do the work. I never have seen one that failed.

However, don't go away. You will now have to adjust the line delivery channel and probably the transfer (see *Adjusting the Line Delivery Channel*, page 100, and *Mats Spill Out at Transfer*, page 226.)

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Compiled by

EDWIN B. HARDING

Professor Emeritus of Journalism and Printing
South Dakota State College

Edited by

NOEL M. LOOMIS

Linecasting Machinist
Minneapolis, Minn.

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