

## CHAPTER XXVII

### THE DISTRIBUTOR BOX

#### Rebuilding the Distributor Box

**LOOMIS:** This is not too involved, but it must be done carefully. First take off the box.

Let's look at the tilting rails, at the lower right corner of the box as you look at it. These are supposed to move freely up and down. The shoulder screws should be taken out, cleaned, and graphited. If the rails are worn, replace them.

Now about the lower rails at the lift end of the box. Replace those if the small surfaces against which the matrix toes impinge are worn.

Replace the upper rails likewise, and also if one of them has a groove in the middle of the inclined portion, or a narrow groove all the way up. Install these always in pairs—never one at a time. Avoid the long (slow) lift on two-pitch screws. That requires a short (quick) lift; the short lift (steeper angle) will work on old style screws, but not vice versa.

How about the distributor box bar? If it is boogered up on the outer end, either smooth it out with a three-cornered file or replace it. The outer end is to be free to move a little up and down for alignment with the second elevator.

Watch out also for the bars with long bar points. Thin mats may twist in these. Unless you have mats over 14-point, use the short bar point.

The bar point, if broken, should be replaced.

I generally replace the Distributor Box Matrix Lift Lever Hinge Pin (G-100) on principle, and also the hub (G-90).

The Matrix Lift Lever (G-96) and the Matrix Lift Cam Lever (G-435) should be replaced if the hinge pin holes are sloppy. When these are put together with the hinge pin and the hub, all must work very freely. They do not always do so without some dinging.

The Matrix Lift Cam Roll (G-101) may as well be replaced also.

The Font Distinguisher Block, whichever one you have, usually has a flat side and needs replacement. The Matrix Lift is usually worn, and also the screw for it. I always graphite this screw, and it can be oiled successfully and save much wear.

If you have slow distributor screws, you may well use the mat lift and block that separate big mats by one space. These are G-2364 and G-1517, and the odd-headed screw can be adjusted to separate mats of whatever thickness you wish (usually quads of about 10-point.)

The font distinguisher calls for a look. This is formed of two parts that screw together, with a flat spot on one screw which holds the font distinguisher (a tiny piece) upright. The old style is adjusted by screwing in and out. The automatic ones must slide freely under the tension of the spring.

#### **Adjustment of the Distributor Box**

LOOMIS: Now to make it work.

Put a thick pi mat in the box and hold it flat against the four points on the rails. The four prongs on the box should be bent in to just clear the toes and ears of a new mat. Then bring the mat out onto the flat places at the very ends of the rails and see how much play there is. There should be about .003" on each side. Much more will invite twisting. Sight down the rails and see that you don't bend one more than the other.

Now you will need a small square to lay across the flat places on the ends of the rails and see if they are level. Some machinists speak of tapping these rails up or down to level them, but I have had poor luck at this. The pins fit too tightly, and I generally wind up grinding one off a little - which in itself is plenty tricky, as you will find if you try it. Nevertheless, these rails must be the same height. Smooth with fine emery paper.

Now back to the bar point. Take the thinnest mat (a thin space marked .0277) and put two of them in the box together. Be certain that the bar point will hold back the second mat. If not, you can peen it out. You can also break it if you don't hold it perfectly flat on something solid. The bar point must allow one mat of any thickness to go up; therefore it must be exactly centered in the slot in the mat; if it is too long, file it off carefully. If too short, peen it out.

Now for the narrow flat spring in the front rail. This should be bent out a little, should be free to move in and out of the slot, and should hold a mat against the four points of the rails even while the shifter is withdrawn. I have tried to make a small backward bend in the end of this spring so mats could be backed up past it, but I have gotten into trouble, because the bent-back end of the spring, in a nice tight box, will interfere with passage of mats, for it holds the bulge out too far. Therefore it is safest to keep a straight bend and not try to back mats into the box. At least, Milton Anderson does it this way and it seems to be satisfactory.

The mat lift should be positioned by the block so the shelf just about fully goes under each mat, and no more. You do not want the top to go under. Also you do not want the hold to be so small that the mat will slide off. The perfect adjustment is the width of the thin space (.0277"), and usually the shelf is that wide. The spring on the mat lift should be soft but firm. Intertype springs here are customarily stronger than Linotype.

### Fitting of the Distributor Box to the Machine

Now let's try the box on the machine. But first let's do some checking on the big distributor bar. The distance between the top of the brass strip on the distributor bar and the machine frame should be  $37/64$ " (Harding's measurement). If this is about right, you can set the box.

Notice that there are three very narrow lugs along the back side of the box at the top (the front side as you generally look at it). These position the box in relation to the distributor bar — which adjustment is important. Try the box in place, pushing it up before tightening the screw. Then run a pi mat out onto the flat places at the ends of the box rails. Near the end, the mats have engaged the teeth of the distributor bar while the ears are still on the rails.

This is the point that counts. You should be able to push up the mat with your finger and see it rise freely about .002" or .003" — just enough to be completely clear.

If there is too much space, the mat will jump a little as it engages the distributor bar. In this case, notice again the three very narrow shelves along the top of the box on the back side. These position the box against the frame if you push up as you tighten the screw. Now the box needs to go higher so you will have to file a little off the left lug (as you face the box) and half as much off the center lug. Make it right.

But suppose the mat is tight between the rails and the bar. You can peen the cast iron shelf a little, or you can try copper and brass thin-space shims, or in extreme cases you can tap the left-hand lug and put an adjusting screw in it (this seldom happens, but it happens).

When you get the height of the rails exactly right — and test often — try the box again and see if the thing is tight in place. Most likely it will move up and down. But if you have pushed it up firmly every time you have replaced it, the rest is simple. (If you have not, you have the job to do over again.)

The box may move up and down on the pins (the two very short studs in the upper part of the box). If it wiggles here, it shouldn't. The pins should hold it tight. Turn them half-way around and try them again. Perhaps this time you have to tighten the screw hard to force the pins into the groove in which they fit. You will have to file a little off the side of the pins.

The general idea is to fit the box in here so that it can go in place only one way. Then you don't have to worry about a relief operator failing to put the box back the way you do.

There are now two more adjustments — one easy, one not as easy.

Let's take the easy one first. This is the mat lift. My own preference is to adjust the mat lift at the bottom of its stroke. Hold a mat in tightly. With the lift down, adjust the headless  $3/8$ " screw in the cam lift lever so the lift goes under the mat, and about a point more. Now turn the distributor screw until the mat

lift is at its height. The car of the mat should clear the rail by  $1/32''$  to  $1/16''$ . Some machinists do not approve this  $1/16''$  measurement, but I have found machines where less meant the mat lift had to go too low at the bottom of its stroke.

Incidentally, if you run into a worn mat lift block that allows the mat lift to extend so far into the box that the very top of the lift picks up a mat, so that the lift tries to pick up two thin mats, often you can fix it by beveling and rounding the surface just above the shelf of the mat lift, so that even though the mat lift extends too far into the box, the top part of the lift slides up over a mat.

Now we have only the tough one left — and it isn't tough; it just takes patience.

With an extension light in your right hand, several mats in the box, and the machine at normal, turn the screws, watching very closely to see that each mat, as it is lifted, comes up just behind the screw thread ahead of it. "Just behind" means about two points. If it does not, drive out the taper pin that holds the cam on the end of the back screw. You will find a threaded hole in the thin part of the cam, which will take an 8x32 screw with just about three or four threads. An Allen head set screw,  $1/8''$  long, with the point ground a little flat, is ideal. A longer screw will hit on the frame of the machine. Put the screw in place and put the cam on firmly. Set it so the mat will clear the screw in front by that two points, and *fasten it there with the screw*. This is essential; if you don't, it will slip. Nor will the screw alone hold it; I find this out to my embarrassment about twenty years ago. Now pick out a fresh spot; drill and ream with a taper reamer of any size from 3/0 up to 0. Try it again. If the distance is still there, you are a machinist.

WILLIAM J. BUTLER in the *Printing Equipment Engineer*: This is a rather simple unit, but it needs to be kept in good condition.

It is well to check the adjusting bolt at the bottom of the second elevator lever before starting work on the distributor box. As this bolt should be free at transfer, it should also be loose at normal position.

The shelf in the matrix lift must be square and sharp.

Binding between the edges of the matrix lift and the lower rails is usually caused by wear between the matrix lift lever and its hinge pin screw.

Lack of oil on the matrix lift lever cam roll may cause it to wear elliptically, which will result in a varying upward stroke of the lift.

In timing the lift cam on the end of the back distributor screw, remember that just before the mat clears the shoulders of the rails there should be  $.025''$  space between the upper edge of the mat and the screw edge just ahead of it.

The box rails should be level, straight, and parallel.

If trouble is encountered getting new rails to fit on old dowel pins, use a 4/0 taper reamer in a tap wrench. Start it in the side of the rail which the dowel pin will enter, and open the hole just enough to slip it on.

The narrow flat spring in the front rail should hold a matrix with its ears and toes against the four rails even while the shifter is withdrawn. Be sure the spring works in and out of its slot freely. You can bend it up or down a little — but be careful. It is best to have a new one on hand with rivets.

#### **Matrices Bend on Upper Ears**

**HARDING:** May be caused by a worn bar point that lets two thin mats go up together and bind on each other, getting caught by the screw; upper box rails worn on the vertical surfaces, with the same result; mat lift shelf may be rounded so it slips off when half-way up; upper rails deeply dented, so the ears become bound; the rear screw may have latch play, permitting the screw to sag away and drive the mat by only a very small corner (the screw should be set .005" from the distributor bar); screws may have deep grooves worn in where they first contact the matrix ears, and occasionally a matrix becomes caught in the groove. Such old screws can be welded (no brass) and dressed down or turned down by a skilled machinist.

#### **Mat Lift Fails to Pick up Last Mat**

**HARDING:** Be sure, by patient trial, there is no bind in the box to interfere with mat travel.

Sometimes the machine stops too soon, with the distributor not all the way in. Turn out a half turn on the automatic stopping lever adjusting screw (E-204 or W-425) down below.

There may be a washer on the left end of the distributor shifter buffer that keeps it from going all the way in; or the wrong screw in the shifter slide would do the same thing.

#### **How to Remove the Bar Point**

**HARDING:** Emery the end of the bar to locate the pins. You cannot buy a punch small enough. Take a 1/16" or Size A Starrett punch and grind the end a little smaller — just a little — on the end. Or buy a nail set with a 1/32" point. Then you can start the pins, which are 1/16".

#### **Mats Fail to Feed to the Screws**

**HARDING:** There may be a wrong font or a mat turned backward, or a mat with bent ear or toe; the shifter may have been locked out and forgotten; the lift misadjusted; the bar point bent to one side.

#### **To Get a Wrong Font or Turned Mat out of the Box**

Push it backward with a piece of 6-point reglet.

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