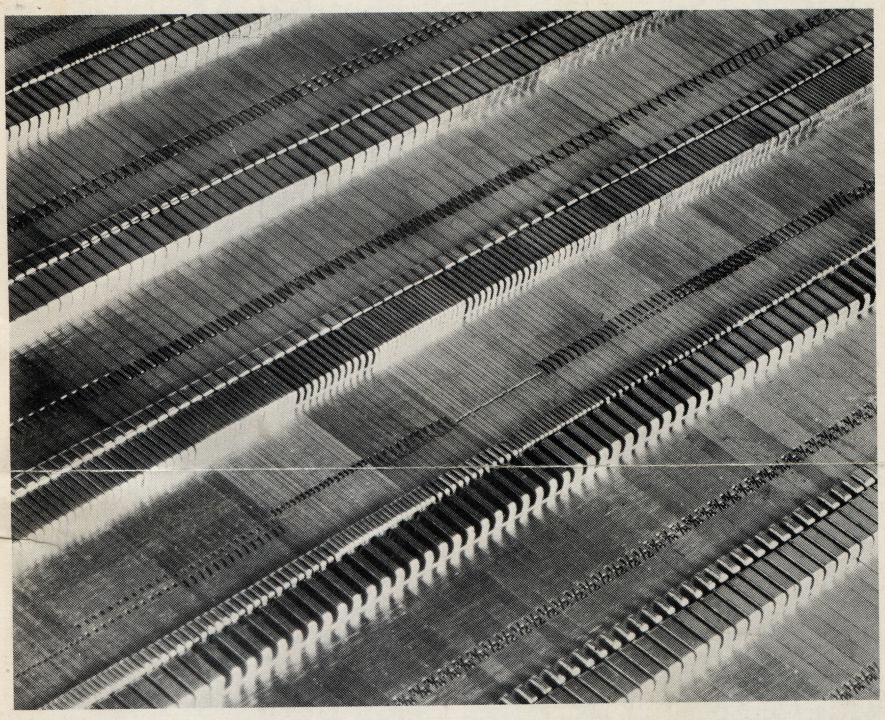
VOLUME 2 NUMBER 2

SHOP TALK

Published bi-monthly by Star Parts, Inc., South Hackensack, N. J. in the interest of those who maintain typesetting machines.



A WORD FROM YOUR EDITOR...

Every day we receive orders from new customers, some of whom we have never called upon. Some send us their first order with a little note saying they like "SHOP TALK" Others have heard of Star Parts through friends in the trade. Some plants have never used Star Parts . . . others may never do so. Yet, the use of Star Parts is increasing, not only in number of customers, but in volume of purchases as well.

What are the causes for this trend? We don't exactly know. Maybe it's the same-day shipment of over 95% of all orders, or it could be because of our many Improved Parts for outstanding machines. Again it might be the quality of our materials and the know-how acquired by doing our own manufacturing, that is responsible for the swing to Star Parts. Maybe it's the combination of all these things.

If you are using Star Parts, you have your own reasons . . . if not, how about sending your next order to us and finding out for yourself?

Quido E. Herman

QUIDO E. HERMAN

SHOP TALK

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MOLDS...the Heart of a Machine

Mold Cleaning and Polishing

Within the past several years, mold cleaning and polishing has become much less of a chore for the machinist. Just before the war a synthetic, which derived its name from the element used as a base for the compound, was developed. It is called silicone. Silicone is a substance which has the ability to withstand tremendous heat, and is therefore used as a mold releasing agent in foundries. Chemically it is completely neutral and has no deleterious effects on metals for that reason. It is used in other industries in various forms, with carriers of various types. One of the fluids adopted by Star for use in our own field was a silicone emulsified with rust-inhibited water, and this was found to be a great advance in reducing oxidation and metal adhesion to molds. However, under certain conditions in high humidity or salt-water areas, this was not an ideal solution for all operating conditions. We therefore experimented further and found that the best solution was a pure form of the silicone in the proper viscosity. "Slic", the Star mold protective product, when used in sparing amount on the front and back mold wipers, gives a very thin coating to the mold surface. Since this material does not burn off at line-casting machine temperatures, it forms a shield between the type metal and the mold. The only reason it needs to be replenished in the felts occasionally, is that the amount deposited on the mold is eventually carried off with the slug.

The use of this silicone compound, "Slic", results in better slug ejection. In addition to helping reduce the drag and resulting "bang" at the time of ejection, keeping the metal from adhering to the front and back of the mold surfaces contributes to maintaining good mouthpiece and front lock-up. By preventing metal from adhering to the front of the mold, matrix life is extended, because the face of the matrix is not forced into type metal which may accumulate on the front surfaces.

An important point to remember is that when using silicones it is necessary to have a clean surface. Consequently, when first making application of this material, be sure to have a new felt installed so that it can absorb the liquid. If the surface of the felt is caked with mold polish or graphite and oil, the silicone will not be absorbed, and consequently it will merely run off into the mold in excess, and act as a wash, like any liquid.

Should it become necessary to clean a mold, remove it from the disk and clean it with a good mold polish, being careful to use a hardwood block in such manner that the pressure on the surface is even. Many molds have been ruined by excessive polishing with abrasive cleaners and a reglet which round the edges of the mold. A rounded edge on the back surface of a mold will cause a feather to appear on the back of the slug corners, and set up an additional resistance to ejection. This also makes an impossible condition when setting trimming knives.

Liners and Mold Warpage

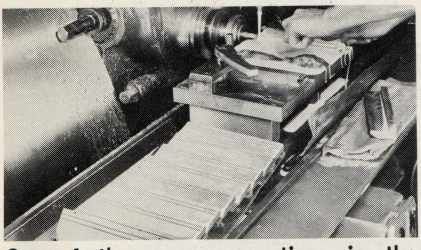
Particular care should be given to liners. If there is as much as a .002" accumulation of metal on a liner or if there is a sliver of metal or dirt on the mold surface when a new liner is put in, it will not only add to the thickness of the liner, but permit more metal to seep under the liner, and eventually cause a squirt by building back to the mold and liner edge. A mold is no better than the care it receives, and liners become a part of the mold when in use.

A liner which has been hit by an ejector blade should not be used again, because it must be distorted by the blow, however light the contact. Likewise a burr on the liner edge which can come from careless handling in the liner drawer or in many other ways, will be the cause of trouble that is sometimes hard to trace.

Mold Manufacture

It takes a year to make a mold prop-

erly. The special steel, as it comes from the mill, is still changing shape as a reaction to the heat and stresses it has been subjected to while it is being made into a tough material. The raw material lies on the shelf for six months before it is put into work, in order to allow the molecules to come to rest. After the actual processing starts, anywhere from one day to eight days rest is given to the material between each milling and



One of the many operations in the manufacture of a mold body.

grinding operation, depending on how severe the operation has been in the amount of metal removed. This changing of shape is what we call warp, and by allowing the mold in process to warp to its ultimate each time, before going on to the next operation, the greatest part of the warping process is completed before the mold comes to the consumer. This, of course, is only part of the curing process.

When the mold has reached a certain stage, before it goes on to the finishing operations, it goes through a process of hardening and stabilizing. Heat treatment is required to bring the mold to the proper state of depth of hardness, and the stabilizing is done through a process of deep freezing which keeps to a minimum any further warping.

In spite of all this care in processing, the steel is still alive. Under the stress of heat on the linecasting machine it will react and warp, but while it is young, it comes back to shape again when it cools. As the years go on this ability to recuperate, as with all other forms of life, is gradually lost, and the mold remains warped. What we have done in the careful processing is to extend its period of usefulness over what it used to be in former years.

Molds will warp in two directions. The caps are primarily a direct concern here. Warp will occur in an arching of the cap as shown in the illustration. It will also warp toward the front of the machine to a greater extent than the mold body, explaining why "snow" will be found more on the front of the mold body than the cap. On a Linotype mold, the bending of the mold posts due to improper banking or support caused by worn mold banking blocks, the first sign of warp will be a slight "fin" on the left hand upper corner of a short line, particularly in the setting of straight matter.

Fortunately, one type of warp can be compensated for, to some extent, in the manufacture of the liner. Star stainless steel liners are ground with an end-to-end taper to take care of the bowing in the center of the mold cap which occurs under heat. From a standard thickness at the right hand end of the left liner, it is tapered down to the other end so that the measurement there will be from .0005" to .0015" thinner, according to the length of the liner. This gives the effect shown in the illustration, and insures that the liner will be held down tight between mold body and cap while the mold is new. It becomes a proportionately more valuable feature as the mold grows older, and the warp begins to stay in the cap. With a straight liner the warp in the cap will show up much more quickly, and therefore its period of usefulness will be shorter.

Mold Repairs

Many molds can be repaired and straightened, if the surfaces have not been scraped by the back knife, and if they have not been damaged in any other way. Excessively rounded edges may necessitate removing too much material; the scoring from a back knife edge may be too deep, and may also result in disturbing the type height so that it is impractical to use the mold again. Rounded edges, as we have mentioned previously, are mostly caused by excessive and incorrect polishing, but incorrectly aligned ejector blades and bowed ones as well, will also contribute to the rounding of the mold edges. It is very important to see that the blades are not hitting the mold body.

Too much play between the mold disk hub and the disk will cause the back knife to indent the back of one mold while a slug is being cast from another mold. It is wise, in most cases, when replacing a mold disk, to replace the hub as well.

Molds that have received the type of wear described above, should be sent into the factory for inspection. They will be happy to give you a report and a recommendation of what can be done. Of course, if it is more convenient, the mold may be sent in to the nearest agency for forwarding to the factory.

Timing Distributor Screws, Spirals and Cam Lift

We have had several requests to furnish information regarding the application of new Gears and Spiral Automatics on outstanding machines. When Star Distributor Screws are ordered in sets, this work is done at the factory, and the screws come to the user completely timed with the exception of the Spiral Automatics which can only be done on the machine. If you are applying new Star Screws, therefore, most of this article will not apply. You can refer, then, to the section which deals with the timing of the Spiral Automatics. Also we suggest that you file this issue for future reference with your other copies of Shop Talk in the special binder which we announced in Volume 1, No. 2.

The part number for the assembled and timed Distributor Screws is our Part No. M-16-L. However, if you are applying the Gears, Cam and Spiral Automatics on your old screws, you can obtain the complete kit of parts under our Part No. M-60 for Linotype, and M-59 for the old style Linotype and all Intertype machines, except the Mixers of course. This kit contains all the necessary Pins and Screws also.

Assuming that you are attempting the job of applying Gears, Spiral Automatics and Lift Cam for the first time, you should have ready the following tools: Drill sizes, Nos. 24, 28, 30, 35, 37 and 46; Taper Reamers Nos. 0, 3/0, and 5/0. A small square also is required. With all these tools at hand, we proceed as follows:

STEP 1—Remove the complete distributor clutch mechanism. If your screws have them, also remove the Spiral Automatics. Be careful to find the small ends of the two taper pins in the Spiral Automatics before you drive them out. Remove the Distributor Clutch Shaft. On Intertypes and old style Linotypes the shaft is held on by only one screw; on later Linotypes one screw goes through the center of the bracket, and the other at the left hand end of the Distributor Clutch Shaft (from the front of the machine). For further identification. this last is a Fillister Head Screw, Left Hand Thread, with Washer.

STEP 2—Inspect Gear and Shaft (Lino. Part No. G-3081, Inter. Part No. V-1806). If badly worn, replace it with Part No. G-3081-A, which is an improved version of the Shaft for the Linotype, as it permits of much more sensitive adjustment.

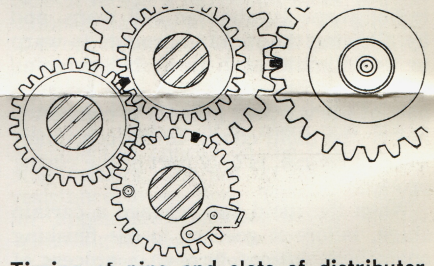
Clean out all holes and parts thoroughly. Inspect all Distributor Clutch parts and replace the worn ones.

STEP 3—Replace the Distributor Clutch Shaft. Before replacing the Gears, we suggest this procedure for the man doing this for the first time:

It is very seldom that new Gears can be applied without drilling new holes in the Distributor Screw Shafts. Therefore, in order not to waste time and energy, immediately plug the old holes which held the old Gears.

Drill a hole in the center of each Gear, using a No. 28 Drill. Tap for an 8-32 thread. A Set Screw will be used in this hole. An Allen Head Screw 3/16" in length is suggested. This will hold the Gears in place while the timing procedure is going on.

Replace the Double Gear on the upper front Distributor Screw, lining up the timing pin with the slot in the Distributor Clutch Gear.



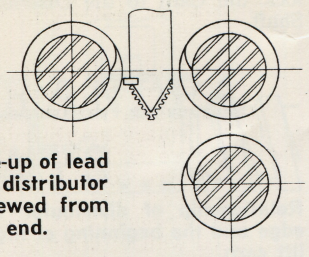
Timing of pins and slots of distributor gears, seen from left end of distributor.

Next insert the Lower Front Distributor Screw Gear, lining up the timing pin with the Distributor Clutch Gear Slot.

Line up the first thread of the Upper and Lower Distributor Screws at the right hand end (looking from the back of the machine), so that they are both in line vertically. It is important that you get this fairly accurate. Here is where the Set Screws suggested above can be used to hold the Distributor Gears to the Distributor Shaft. Hold the Distributor Screw firmly, pushing towards the left while you push the gear to the right against the bracket, taking out all the end play in the Distributor Screw. Tighten the Set Screws at this point. Next install the Back Distributor Screw Gear. Line up the timing pin with the slot of the Front Upper Screw Gear.

Line up the lead thread of the Back Screw in the same vertical position as

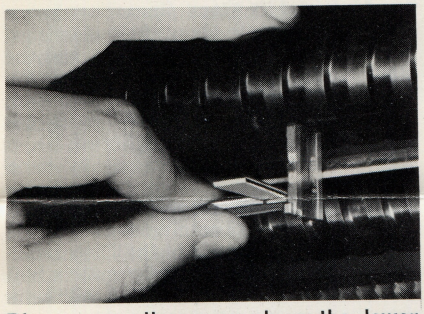
the other screws. Of course the lead thread of this Screw will be on the inside.



Proper line-up of lead threads of distributor screws, viewed from right hand end.

Proceed as with the other two Distributor Screws to fasten the Gear on to the Shaft.

With the Distributor Box removed, hold the pi matrix up against the Screw Lead. Turn the Screw slowly until the matrix enters the Combination Bar. Take the small square and place it horizontally along the lower front screw,



Place a small square along the lower front screw to determine if the matrix is straight, front to back.

the handle end against the matrix. This will indicate if the matrix is straight back to front. If it is not straight, loosen the Lock Screw in the Back Gear. Turn the Back Distributor Screw slowly, either forward or backward to achieve straight alignment. When you lock the Set Screw in the Gear, make sure to follow the same procedure as before to insure that there is no end play in the Distributor Screw.

Now place the Square up against the lower rail of the Distributor Bar so that one side of the Square is parallel with the Matrix. This will indicate whether the matrix is not straight, up or down. If it is not straight, loosen the Set Screw in the Top Front Distributor Screw Gear. Now advance or retard the Lower Front Distributor Screw until vertical alignment is attained. Then lock the Set Screw in the Gear, again making sure to follow the same procedure as before to insure that there is no end play in the Distribtor Screw. We are repeating this caution because it is of extreme importance. Any end play in the Distributor Screw will destroy the whole timing.

Most of us have been taught to run matrices 'up-hill'. By this is meant that the right hand side of the machine must be higher than the left hand side so matrices will lay against the Distributor Screws. The amount of angle has not been definitely established, and is open for a lot of discussion among a lot of machinists. It cannot be too critical, because there are machines operating on ships, and certainly there is no established level aboard a ship.

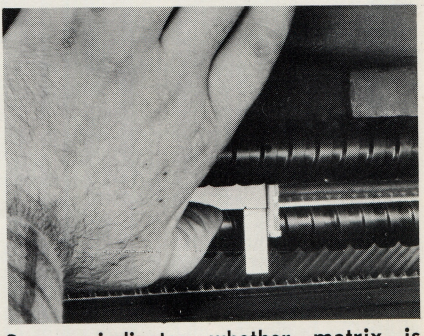
However, it is best to have the matrix travel ahead slightly from .005" to .008". In order to obtain this result first check to see that your machine is level, using a spirit level across the top of the Distributor. Then shim up the right side of the machine slightly. This will cause the matrix to travel in the desired advanced position mentioned above.

STEP 4—Now we proceed with drilling holes in the Shaft for the taper pins. On Linotypes with Spiral Automatics, drill part way into the Distributor Shaft through the large holes of the front upper Gear and the Back Gear with a No. 24 drill. Turn the Screws till the small end of the Gear holes are visible and drill part way through the same Gear holes with a No. 30 drill.

Now go back to the large holes and complete the hole with a No. 30 drill.

Ream through the large side of the holes with a Taper Reamer No. 0. Insert the Taper Pins in the holes of both Gears and Shafts.

On the Intertype and old style Linotype without Spiral Automatics, follow the same procedure with ALL the Distributor Shafts including the Lower Front Distributor Screw.



Square indicates whether matrix is traveling vertically in the screw threads.

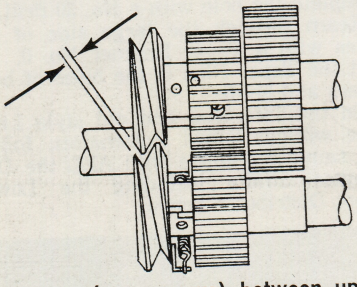
STEP 5—Place the Spiral Automatic on the end of the lower front Distributor Screw Shaft with the pin, which protrudes from the side, in up position. Turn the Spiral Automatic to the right until the pin rests on top of the pin of the Gear. Lock the Set Screw in the Spiral Automatic.

Turn the Screw ¼ turn and drill a hole with a No. 46 drill through the Spiral Automatic and the Shaft. Ream with a No. 5/0 Taper Reamer, and insert the Taper Pin.

STEP 6—Remove all the Set Screws from the Gears. Hold the Spiral Automatic and work the Lower Gear back and forth to make sure there is a free movement, as the Lower Gear is a floating one.

Install the Spring across the two hooks, one on the Spiral Automatic, and the other on the Lower Gear. There are two different sizes of Springs, one being used for the Auxiliary models of Linotype and the other for the non-Auxiliary machine. It is important that the correct Spring is specified when the repair kit is ordered. The function of this spring is to hold the two pins previously mentioned, together.

Now place the Upper Spiral Automatic on the end of the Upper Distributor Screw Shaft, Front. As you do so, turn the Spiral so it dovetails inside the Spiral of the Lower Automatic. The thick portion of the Upper Spiral should be about in the center of the V of the Lower Automatic. Tighten the Set Screw

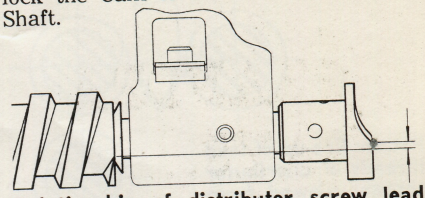


Clearance (see arrows) between upper and lower spirals should be equalized.

on the Upper Automatic. Holding the Lower Distributor Screw, turn the Clutch Shaft forward so that the two pins will separate about ⅛". Then drill with a No. 46 drill, and ream out with a No. 5/0 Taper Reamer.

STEP 7—The Matrix Lift Cam is now placed on the right hand end of the Back Distributor Screw. As a starting point align the beginning of the high point of the Lift Cam slightly ahead of the lead edge of the Distributor Screw thread.

Using a very short Set Screw (8-32), lock the Cam to the Distributor Screw Shaft.



Relationship of distributor screw lead edge and the beginning of high point on lift cam.

Replace the Distributor Box, making sure the Lift Cam Roller is not badly worn. Otherwise it will cause improper setting of the Lift.

Place a large matrix in the Distributor Box, advancing it as far as it will go. Place the Lift Cam in its lowest position. Press a screwdrive bit against the top of the lower lug of the matrix. Raise the Matrix Lift Cam Operating Lever and see if there is about .010" clearance between the Cam Lever Roller and the Matrix Lift Cam. If not, loosen the Lock-Nut on the hub of the Lift Cam Lever, and adjust the screw in or out as required. Lock the Set Screw.

Turn the Distributor Screws by hand very slowly. As the matrix starts to rise into the Screws there should be a 1/32" clearance approximately, between the matrix and the thread of the Distributor Screw. If lifted too soon, the matrix will hit the Screw thread, and this will be a sign that the timing is not right.

In such case, loosen the lock-screw on the Lift Cam and retard the Lift Cam as much as you judge is needed. Repeat the test with the matrix until the proper timing is achieved.

If timing is too late, the same procedure is followed in reverse.

Now try running the matrices of various sizes under power to check results. When you are satisfied that the adjustment is completed, proceed to fasten the Cam to the Shaft permanently.

On Lift Cams which have a very large hole on one side and a small one on the opposite side, spot with a No. 35 drill and then use a No. 37 drill through the small hole. Then use a No. 3/0 Taper Reamer on the small side. The reason for this seeming contradiction is to insure that the pin will come somewhere inside the diameter of the hole on the larger side. It is difficult to drill a hole that will be exactly in the center on the other side.

This completes the installation of new Gears on the old Distributor Screws.

GRANDPA SAYS...

Stopped by to see Grandpa on the way home one night last month. Grandpa was in a reminiscing mood . . . "Remember one time when I was a kid, a bunch of us was goin' swimmin,' and to get back to the pond we had to cross a little stream. We used to call it a 'branch' in those day. Well sir, I knew a short-cut where I could cross on an old log that laid across the branch, so away I went. And wouldn't you know it, of all the times I'd crossed that dern log—this time it gave away with a sort of sickening crunch. I'll never forget the sound that log made when it dumped me in the branch. Never will forget that sound, son, long as I live . . . maybe it was because I got soaked to the skin. Tell you another sound I won't forget..."

Thought I'd kid Grandpa a little, so I said, "What's that, Grandpa—was it the time you heard the owl on the top of your house that night, and grabbed the shotgun, aimed too low and knocked half the shingles off the roof?"

"Nope," said Grandpa, "That was another story, but this was when we was late gettin' out the paper and some how the guy running old "Bessy" tried to push a 14-pt. slug, no it was a 12-pt slug, out of the machine when the knives was set fer 6-pt. Well, the machine stopped, but this dern fool gave the clutch a couple a healthy yanks, and then it happened. Sounded like a cannon, and then somethin' hit the floor back of the machine. Yep, cracked off the whole top of the ejector lever, you know, with the big handle back there. Clean as a whistle, son. Got it welded, but it never was straight. Jest plain carelessness, ain't no sense in jest yanking the clutch when the machine stops like that."

Grandpa is sure right, when a machine stops, it should be checked rather than to just pull the lever.

A look of satisfaction came over his face, and Grandpa went on: "They tell me now for a couple a years you fellers at Star Parts got a Shear Pin or somethin', that you take out that wing pin in the ejector lever and put this one in. Tell me it is undercut so's it'll snap off before it will break the big lever or pawl."

"Yes," I assured him, "believe it is BB-41-A for Linotype and W-250-A for Intertype, and it sure saves a lot of noise around the shops, to say nothing about the clatter when the parts hit the floor." I figured Grandpa was trying to pull a fast one, so I asked him: "Wasn't that machine at the Clarion, Grandpa?"

"That's right," he replied.

"That's what I thought," I said, "but didn't you tell me one time that you were the only one that ran that machine while you were there?"

"Look here, son," said Grandpa, hastily picking up the paper again, "See this feller doin' the swan dive? . . . well we had a feller back home . . ."

At Star Parts, sales and marketing problems are quietly discussed in the dignified atmosphere of reason and logic.

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