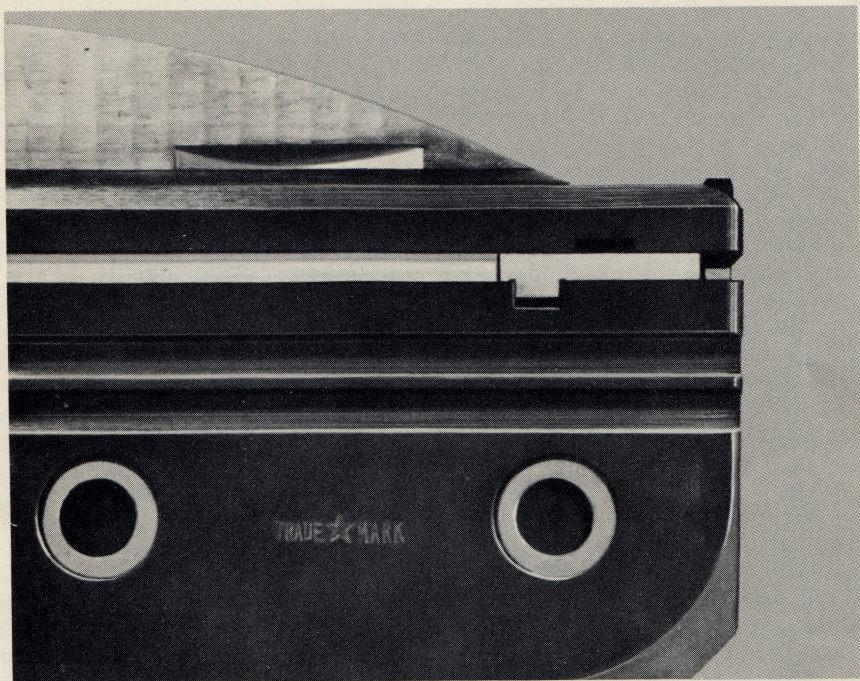


VOLUME 1

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...

Your many letters of congratulations on Vol. 1 No. 1 of SHOP TALK and the fine comments you have made, are most gratifying. Many of them are from friends we have known in various parts of the country for many years. Others are from people we hope it will some day be our pleasure to meet.

For this encouragement, for your time, for your friendship, may we say in all sincerity and humbleness ... Thanks.

Quido E. Herman

QUIDO E. HERMAN

P.S. A lot of our friends have asked us to allow enough margin so they can punch their copies of "Shop Talk" and collect them in a binder. Well, we've decided to go a step farther than that. With this edition we will begin punching all copies. In addition, we have designed an attractive binder especially for "Shop Talk." This is available at 20 cents, so if you'd like one send along a couple of dimes—no stamps please—and we'll mail it right out to you.

SHOP TALK

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OVERSIZE PLUNGERS...

How to use them—

Last week one of our friends asked if he could return the .005" oversize plunger he just received and wondered if we carried a .010" oversize plunger.

"Sure," we assured him, "but I doubt that a .010" plunger will fit." His answer was: "Of course it will fit. The .005" plunger still leaves metal boiling around the pot at time of cast, so it will certainly take another .005".

We eventually got the right plunger, but it wasn't a .010" . . . it was a .020". We re-honed the crucible well, and actually he now has a crucible just as good as new at a fraction of the cost.

There has been a lot said about wells wearing egg-shaped, plungers having to be fitted and turned down on a lathe, even problems such as a plunger being tight and still leaving a "boil" at cast.

Let's get the answers to this plunger question—and let's find out about the hole in the plunger being there "to let the air out of the well!"

It is true that wells do wear, but most of them are not egg-shaped. They take the shape of a bell. The top of a well is subject to very little wear, but the bottom wears from the pressure at the cast. As wear increases, there is more play between plunger and well, enlarging the well still further at the bottom.

This explains why a plunger may be hard to remove, yet will permit a by-passing of metal at casting, resulting in poor slug quality.

That is why we questioned the use of a .010" oversize plunger. There was probably not enough wear at the top of the well to permit this size plunger to enter the well. If it did, there would be even more wear at the bottom, so the benefit of a new plunger would be lost.

We will now tell you of the methods we use, so you can rent or buy one of our well hones. If you are a machinist you will have no trouble in getting a real good job on your crucibles without removing the pot or crucible from the machine.

First, remove the plunger and give the well a real good cleaning. Use a 3-blade well scraper, wire brush or other tool and get the well as clean as possible (this is to keep the stones of the hone clean and free from excessive dross). Turn off the heat, either gas or electric, and remove the pot thermostat, then the pot cover. Before the metal freezes, use one of our miniature ladles and dip out every bit of metal you can from the pot, getting down in the pot well, so there is space for the hone. Do as good a job of removing all the metal as possible. Next, remove the pot pump plunger arm.

We always do this portion of a honing job in the evening, leaving the pot to cool over night until the crucible is "stone-cold." Never attempt to hone a well if it is warm.

The tools you will require now are as follows: one hone, one electric drill with a $\frac{1}{2}$ " chuck. Insert the hone into the well and adjust the hone so it is quite snug, to prevent chattering as the stones make their first cut. Make a clean-up cut with the hone and maintain an up and down motion of the hone at all times while doing the job, so the sides of the well will be straight.

Now you can see what is meant by a bell-shaped well. You will notice most of the cutting will be done on the top portion of the well, gradually working down the sides until the well will be cleaned up and smoother than you ever thought possible. Continue this honing until you can see the well is being honed to within $\frac{1}{2}$ " of the bottom. Do not attempt to get all the little scratches out of the well, like the time a wire got caught between the plunger and well. These little nicks will make no difference, as they fill up with dross, anyway.

How do you know what size plunger will fit into the well? This is going to be real easy and here is where we will show you another short-cut. New machines have a plunger fitting tolerance of varying amounts—from .003" to .005". We have had trouble with sticking plungers if we fit closer than .005", so we have set .005" clearance as our standard. Star manufactures plungers as large as .090" oversize. There is no reason why you cannot fit a plunger to that size—there is plenty of material in the casting in the crucible. If we are honing a well for the first time, we taken an assortment of plungers in .005" increments from .005" to .030" oversize. When we get a well honed to within $\frac{1}{2}$ " of the bottom, we then

try a .010" plunger. If it drops in, we then try a .015. If this fits, we then try a .020" plunger. If this fails to go in, we then continue honing until the .020" will just fit real snug. This will probably clean up the balance of that $\frac{1}{2}$ " on the bottom of the well. Now, here is how we get that true .005" clearance without indicators, feeler gauges, etc. When the .020" plunger fits real snug—we simply take it out and use the .015" and there is your .005" clearance. In other words, use the plungers as gauges. Get one that fits tight, then use the plunger .005" under that size.

You are now ready to put the pot cover, thermostat, etc. back on the machine. Here's a tip on how to replace the strong plunger spring. While the pot is still cold, run the machine forward to cast, and let the plunger arm come down as though you were casting a line. Then use a wire or strong cord and lift the end of the spring over the plunger arm—then let the machine complete its revolution. All the hard pulling will be done by machine power. If you have metal from another pot to place in the newly-honed pot, add it slowly, to prevent distortion of the crucible and well. Be sure the plunger is hot before attempting to insert it into the well.

PLUNGER VENTING

The purpose of the hole in the bottom of the plunger is not to let the trapped air escape—(it will escape around the plunger clearance) but is to give over-motion to the plunger on small lines of type, and prevent a dross build-up at a given point on the well. Theoretically, a plunger, if fitted perfectly would descend only enough to force an amount of metal into the mold equal to the displacement of the mold. You can therefore see that a 5-pt. 10-em slug would require very

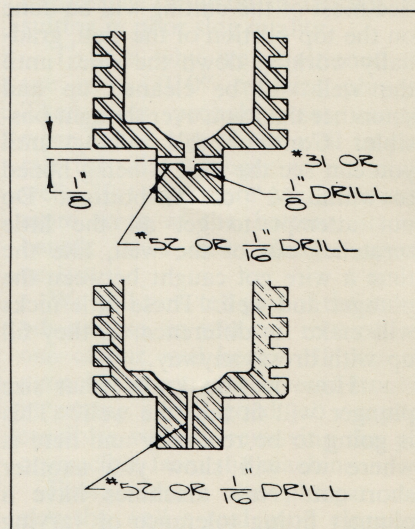
little motion of the plunger. If the plunger stopped descending at this point and remained there, the timing of the cams for the mouthpiece break-away from the back of the mold is such that there would be a pressure exerted on the plunger AFTER the break-away. Metal would then be forced out the mouthpiece holes *after* the cast. On the next line a back-squirt would result because of metal on the mouthpiece. This is exactly what makes a machine squirt if the plunger sticks.

The reason for the hole is to permit the plunger to descend to a point where the pot pump cam is starting to lift the plunger at the time of break-away. This is very important. Star does not drill holes in new plungers. Why? Simply because all Star plungers are used in crucibles which have been in use and have some wear. If the plunger goes to the bottom of the well when the machine is stopped at cast, there is no need for the hole. You actually want all the pressure you can get. When a well is honed, it is necessary to drill a hole to secure this continued "follow-thru" of the plunger. This is accomplished by one of two methods as shown in the drawings.

It is advantageous to remove the mouthpiece and saw out the throat when doing this job. Also include a new plunger rod with the aluminum shield.

It is very important that the bottom of the plunger be above the holes in the well when the machine is in normal position. Check by inserting a mouthpiece wiper hook into the hole from the outside of the well. Then slowly push the plunger down until it is stopped by the hook in the well. At that point, sight the slot in the plunger rod with the plunger arm. It is sometimes necessary to replace the pot pump plunger cam roll with an oversize roll to achieve this plunger position, especially if the pot pump cam is worn.

A word of caution . . . be sure you clean the plunger and well daily.



Linecasting machine parts...

HOW THEY ARE MADE

In the January issue of Shop Talk we ended the first installment of this story at the point where the raw material has been ordered for the manufacture of the new part. After a period of weeks or months, depending on the nature of the part

involved, all the details of engineering, tool designing and making have been pulled together, and production is ready to begin.

It takes a variety of machine tools to process a part. It may need five operations or a hundred. Every

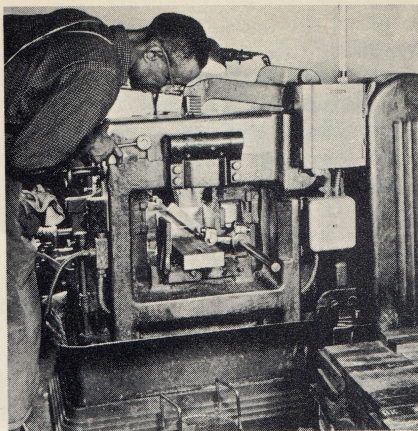
time a man handles the part in manufacture to alter it in some way, it is called an operation.

The first operation for most parts, except castings, is the cutting up of the raw material to the approximate size of the finished part. This is done on an automatic saw made to cut tough steels. The second operation, if the part is flat in shape, involves squaring off the raw stock. This operation is usually done on one of the milling machines.

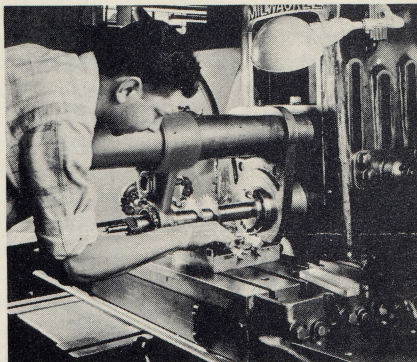
A milling machine is equipped to remove metal in small slivers or to "hog" out large pieces of steel. It is the work horse of the machine shop. Hundreds of different cutters are used for the purpose of shaving the material or shaping it. Each cutter is designed for the specific job and stays with the tools for the particular part in the tool crib when the job is completed. It will be used again when the part comes up for production again.

In some cases, huge grinders are used to remove the mill scale from the raw material and to square off the stock. This process of squaring which we have referred to, is necessary to give the part an accurate surface to work from for the measurements which must be obtained in the final piece.

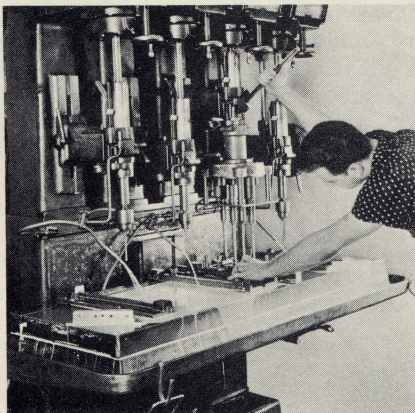
Let us return to the milling machine to observe the various operations which may be accomplished on these versatile machines. The next operation may be a slot. Here is where tool design is important. Milling cutters are engineered according to the amount of stock to be removed at one time, the speed of the cutting, and type of material to be milled. The skillful tool designer can save operations by sometimes arranging to cut slots on two or maybe three pieces at once in the fixture which he designs to hold the work on the bed of the miller.



As a first step, an automatic saw cuts one or more pieces of stock to rough size.



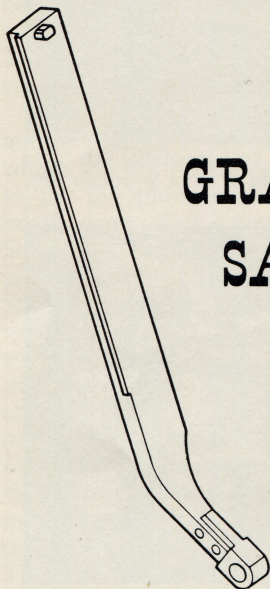
Mold bodies are clamped in position for a milling machine operation.



Single and multiple spindle drill presses are used here in mold body manufacture.

In all of the high speed or heavy operations, it is necessary to keep the work cool, because of the tremendous heat engendered by the cutting tools or the grinders in operation. It is these heats which cause the molecules of the materials in

work to react in the form of warp. To reduce this warpage, there is a constant flow of an emulsion made up of oil and water in different viscosities according to the individual needs of the particular operation. (To be concluded in next issue)



GRANDPA SAYS...



It was raining a few days ago, and who should drop in the office but our old friend Grandpa. He's been away from machines for several years, but he still likes to come in and see what's going on in the back shop. Told us he was going to get a new power lawn mower this Spring.

"Guess I jest ain't got the 'push' I used to have," said Grandpa. "Kinda reminds me of a machine I was runnin', old 'Bessy' I used to call her. She would wheeze and groan, but she'd still turn out a lot of lines. Well the old gal jest got tired, I guess, and it seemed she didn't have enough 'push' either, 'cause she couldn't get the slugs out of the

knife fer enough to get 'em in the chute. The first thing I knowed, they'd get piled up . . . got sorta aggravatin' after a time. Seemed like the whole ejector business down there had jest enough wear in a couple of places that she couldn't quite make it."

Grandpa's face lit up when he said: "You know, son, got to thinkin'—'bet those people back at the Star Parts place got something to cure a thing like that, so I got out the Star catalog and started lookin'. You know when I got to the ejector stuff, sure enough, it said right there . . . 'Improved Ejector Blade Controller.' Well maybe this was what old 'Bessy' needed, so I ordered one of them Controller things. Came in on a Tuesday, I believe—nope, it was on a Thursday morning, 'cause we were gettin' the paper out.

"Derndest thing I ever saw," said Grandpa with a smile, "I just took out the rod and pulled the old one

out of the slide, slipped the new one in and away she went. That little extra lip that sticks out there was jest enough to get them slugs out, and to think I'd been fighting her all that time.

"Funny thing about them Star people . . . they make so many of them Improved parts that you can put in without a lot of fussin' around, and by golly, they sure do work nice.

"Why I remember one time . . ."

TOOL CRIB

In some places it is difficult to get machinist tools, especially precision tools such as micrometers, good punches, special taps, etc. For that reason we have shown some of the more useful tools in our catalog, and most of them are Starrett tools. Also shown are tap and die sets, and you can even get separate taps, like that little 4-48. It's almost impossible to get some of these tools, even in the best hardware stores. There are over six pages of tools in the new catalog, and the right tool will do a better job, and make your work easier, too.

One of the special tools we manufacture is the Star Vise Aligning Block. This precision block is inserted in place of the front jaw, and makes it so much easier to adjust front lock-up, mold advance, jaw tolerances and squareness. If you have a problem of "snow" this tool gives you something to work with, so you can pin-point the trouble and correct it. Part number is Z-84 and it's on page 174. Complete instructions are included, and it is not expensive. The factory made up a few for their own service men, and some of the boys saw them and wanted some, so they made up some more and included them in the catalog. It's a real nice tool.

In a later issue we hope to discuss front lock-up and some of the things to be on the look-out for on your machines. Sometimes they can be "mean."

Whenever thinking of tools I'm reminded of the story Herb Breitenborn, machinist at Pacific Typesetting Co., Seattle, told about a machinist he once knew. Herb said he was working on a paper in the midwest and a tall, lanky machinist blew into town, slipped up, and was hired.

He walked over to the bench and started running lights and evidently did all right. The foreman noticed that he didn't have a tool box, so waited about three days and finally went to him and said: "What about your tools, are you having them shipped in?"

With complete amazement and disgust, the fellow reached in his pocket, pulled out pliers, a 6" Crescent wrench, and two screwdrivers and said: "What do you think these are?"



Quality is more than just a word at Star Parts. Every improvement is thoroughly checked out by a qualified expert.

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