
The NEMES Gazette

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The Newsletter of the New England Model Engineering Society

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Our next meeting is at 7:00 PM on Thursday
5-Oct-2000 (first Thursday of every month) at
The Charles River Museum of Industry
154 Moody Street
Waltham, Massachusetts

Annual dues of \$20 covers from Jan to Jan.
Please make checks payable to NEMES and send
to our treasurer. (Address in letterhead).

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From the Editor's Desk

By Kay R. Fisher

As many of you already know the previous editor and our major contributor to the Gazette Stephen Lovely has undergone a heart bypass operation. Ron Ginger called Steve and all is well. He came home from the hospital on

Saturday 16-Sep-2000, and will be recuperating for about 8 weeks. He said he feels fine, expects to be back to normal, and go get “the big shaper”, about December. His wife will drive him to the next meeting. He has filled about half a notebook with hospital notes and has more to catch-up on. Good news for all of us. If you want to send Stephen a card his address is:

Stephen C. Lovely
P.O. Box 277
15 Lucia Dr.
Milford MA 01757

Up until now we have never had an advertisement in the Gazette that could be considered a commercial. I want to keep it that way and hope to never accept payment for advertisements. However some of our members are also running small businesses, and where the advertisement seems (in my opinion) to serve the interest of the group I will put them in the Gazette. This month in a related subject we have a “For Sale” ad that I think falls into this category. Extending this just a bit further I see no reason to exclude an advertisement from any small company on a free and once-only basis. I'm thinking specifically in this case of club members who have done our club a great service by making available cut offs in the parking lot at reasonable prices and discounts on Sherline equipment. So if you're a member and would like to place a small ad send it to me. If it fits and seems appropriate I will publish it.

Kay

The President's Corner

By Ron Ginger

October Meeting

Our October speaker will be Denis Edkins, talking about his experience with the development of jet engines. Denis was one of the real pioneers in this field, and should have a very interesting talk. He will be talking both about the historical side and some very interesting technical information.

November Meeting

There seemed to be some interest in CNC and step motors, so Earle Rich and I will combine to do a session. I will try to keep it focused on a good low cost CNC system anyone could build.

October Show

The American Precision Museum is having its first show on Oct 21-22. This is in Windsor VT and is near enough that a lot of us should be able to get there. We will have the club sign and will try to get all of us together in one area. I am looking forward to this new show.

North Shore Car Club Show

We had this show on Sunday, Sept 10th, and I think the few of us that were there had a very good time. The weather was about as fine as it gets, the crowd was good and everyone seemed to be very interested in our work. And we had a great range of work to show, from our usual models to Dick Boucher's CADDIGGER, a good size backhoe he recently built.

CABIN FEVER

Well, it is about time to get serious on this trip, so I will have a sign up sheet at the next meeting. I assume the bus fare will be about the same as last year, \$70, and the rooms are going to be slightly lower in cost. I will get some details together in a flyer for the next meeting, and will

have them in the next newsletter for those members who don't get to the meetings.

We also need to settle on our plan to build something at the show. As you will recall, I have offered to have our club run some machinery to demo to the crowd and build some small object. So far it looks like either Stephen Lovely's little whistle or a gyroscope/top. If anyone has another idea please, call me ASAP at (508) 877-8217 evenings.

Ron

Treasurer's Report

By Rob McDougall

As of 8/31/00

Balance 7/31/00	\$2,770.71
Dues Received	40.00
Interest Income	1.90
Less:	
Gazette expense	-129.10
Part reimbursement for 9 books + videos on Scraping	450.00
Balance 7/31/00	\$3,133.51

Note: Maintenance of the official membership database now resides with the Treasurer. Please notify Rob McDougall of any updates in your contact information.

=====
Rob

Calendar of Events

By Bill Brackett

Oct 1 Owls Head
Foreign Auto Festival

Oct 5, 2000 Thur 7pm NEMES Club Meeting
Waltham, MA.
Charles River Museum of Industry 781-893-5410

Oct 7 9-4 Yankee Steam-Up
The New England Wireless And Steam Museum
401-885-0545 Robert W. Merriam, Director

Oct 7-8 Water's Farm Days Show
Exit 4 (Sutton) From 1-395 4 Miles To Douglas
Rd. Right After Church Then Left On Waters Rd.
W. Sutton, MA
Butch -508-234-5035

Oct 7 Lebanon Show
Tomapo Farm, Off Rt. 120, Lebanon, NH
Bruce Townsend 603-448-1125

Oct 14-15 Cranberry Flywheelers Meet
Edaville RR
S.Carver, MA
David Moore 508-697-5445

Oct 14-15 Martha's Vineyard
West Tisbury, MA
Dale McClure 508-693-9456

Oct 15 Roland's Shop visit and swap
90 S. Spencer Rd. Spencer MA
Roland Goucher 508-885-2277

Oct 15 Owls Head
Ford Vs. Chevy Meet

Oct Granby Show
Call George Randall 413-467-9541

Oct 21-22 Bangor, PA Show
Jacktown Community Center, Bangor, PA
610-588-7466

Oct 21-22 Model Show- Windsor, VT
American Precision Museum
Call: 802-674-5781
www.americanprecision.org

Oct 29 Owls Head
The Great Fall Auction & Open House

Nov 2, 2000 Thur 7PM NEMES Club Meeting
Waltham, Ma.
Charles River Museum of Industry 781-893-5410

To add an event, please send a brief description, time, place and a contact person to call for further information to Bill Brackett at wbracket@ultranet.com or (508) 393-6290

Bill

Connections

By Max ben-Aaron

I love my shaper for many reasons. It has a great deal of brute strength while being very precise and (big plus) it uses single-point tools -- cheap, easy to shape to my needs and easy to sharpen. Except for fly-cutters on the mill, the lathe is the only other machine that uses single-point tools.

I had always thought that high-speed steel was a fairly recent invention. Turns out that an Englishman, Robert F. Mushet invented "self-hardening steel" way back about 1868. Unlike tool steels known before that, which required quenching from high heat to become hard, Mushet's steel, also known as "air hardening steel" was excessively hard after air cooling and retained that hardness even after high tempering.

Other air-hardening steels were soon introduced to compete with Mushet steel, without infringing on his patents. As Don Strang mentioned last meeting, Mushet became embroiled with Bessemer over patents and died poor, an victim of the "Second Mouse Principle" ("The early bird may get the worm, but its the second mouse that gets the cheese").

High-speed steel must have been expensive (and the quality may have been uneven because there was a lack of uniform ferro-alloys needed in their manufacture) so the invention of the tool-holder did much to make its use widespread. I do not know for sure who invented tool holders, but in 1895 the Armstrong Brothers Tool Company started making them, and they still make the best (usual disclaimer).

The tool holders replaced the heavy individually forged cutting tools that had been necessary until then for lathe work. With the Armstrong system, a forged, permanent shank was used with various shapes of small interchangeable cutting tools. As advertised, the Armstrong system did indeed save “all forging and 70% of grinding” and by the mid 1900's the use of forged cutting tools in machine shops was virtually unheard of, replaced instead by the Armstrong System of Tool Holders.

Armstrong was founded in 1890 by the four sons of a Scottish immigrant blacksmith. Initially the company manufactured and distributed bicycle parts and the tools and equipment that were used in the manufacture and repair of bicycles. The bicycle business peaked and declined and Armstrong got out of it and concentrated on the manufacture of tool holders and related machine tool accessory items. They are still in business and their brand is known for plain uncompromising quality.

Mb-A

Zerk Oil Guns – part 2

Editors note: Let us revisit this discussion on zerk oilers some more. I made mine from the plans in one of Guy Lautard's bedside readers (highly recommended) but I'm not real happy with the way it works. My Myford has zerk-like fittings but they are smaller than a standard zerk so the fittings on grease guns don't fit – any suggestions? In Max's coverage of the meeting you should note that Don Strang had a zerk oiler and some thoughts about it.

The following is from Bob Neidorff.

Regarding the oil gun problem that Jay mentioned, I had the same problem and got two different answers. The guts of the problem is that zerk fittings have a tiny ball with a stiff spring, so it takes a LOT of pressure to depress the ball. If the spring pushes with 10 pounds of force and the ball has a diameter of 1/16", then you need approx:
$$P = \frac{F}{p r^2} = \frac{10}{p (.03125)^2} = 3260 \text{ PSI}$$
 to open a zerk fitting. That's one heck of a lot of hydraulic pressure for a little oil gun.

One answer came from Don Strang, who advised me to hit the zerk fittings with a torch and anneal the spring that holds the ball.

Then you can oil it with any old oiler, such as an Eagle squirt can fitted to a zerk fitting. I didn't try that idea, although it makes sense. One problem is that common zerk adapters also have a spring in them, so you need either a weak adapter or a modified one.

I also got advice to modify a common grease gun to accept oil. The common grease gun can develop 5000 PSI. I did that modification and can report that it works fine. I can oil zerks on my mill easily and the gun doesn't leak. The modification is on the web in Metal Web News at:

www.metalwebnews.com/howto/oilgun/gun_convert.html

The essence of the conversion is to remove the plunger and gasket from a common grease gun by cutting the rod in half. Then use the sliding gasket, which you removed as a plug for the hole in the cap at the end of the grease gun. Total cost is <\$15 and 30 minutes of work.

Bob Neidorff

Jim Paquette sent me a note that he has some oil guns that work for Bridgeport way lubrication. I put his input in the “For Sale” section of the Gazette.

The Meeting

By Max ben-Aaron

The Meeting, 7 September 2000

The venerable Ron Ginger opened the meeting with some remarks about a new public address system. There will be a new system, he promised, that would meet our needs without breaking the bank. Karen LeBlanc was going to sound out the maintenance crew about our being allowed to install permanent P.A. speakers on the walls.

Forthcoming events:

Roland Gaucher's flea market - Sunday October 15th. Highly recommended.

Cabin Fever. We have an opportunity to actually set up a small production facility and use it to demonstrate the use of machine tools while producing some small item to give away to kids of all ages. Machines (lathe, mill) will be available. Marty Feldman suggested a yo-yo and Steve Lovely proposed a whistle, as the product. This topic will be discussed at the next meeting and there will be a sign-up sheet for the bus.

NAMES. If enough members are really interested, we could organize a bus trip for the 14-hour journey.

American Precision Museum's Model Show at the end of October. Pre-registration is required for exhibitors. Dave Stickler brought application forms. More details will be available at the October meeting.

Next month the speaker will be Dennis Edkins, who brought a launch steam engine to show at the July meeting. He was a member of Frank Whittle's original team (and the last survivor) that built the first British jet engine and he was principal designer of the a very large volume production G.E. engine.

We need to set up a subcommittee to select and organize speakers. Any volunteers? Kay Fisher suggested that some of the talks given earlier in the club's history could profitably be repeated - Henry Szostek's entertaining lecture on

cannons, for example. Errol Groff offered to repeat his talk on measuring threads using the three-wire method.

One of the members requested a talk on "dynamic balancing". This led Roland Gaucher to give us the benefit of his experience balancing tires. The upshot is that each of the components - wheel, tire etcetera. - has to be balanced individually before the entire ensemble can be tackled. It is essential to balance the whole assembly.

Item: Does anybody know of a speaker who would 'volunteer' to give a talk on welding? Perhaps two: one on gas welding and one on arc welding?

Speaking of welding, Errol Groff loaned Ron a Henrob torch to try out. Ron's verdict: "The magic resides in the hands of the salesman who demonstrates the torch. The delicacy of the flame may be very useful but it does not justify the high cost of the torch."

We ought to have a survey of the equipment that our members own. Kay Fisher did one a long time ago, and it needs to be updated. Dave Piper volunteered to conduct the survey.

Henry Szostek announced that he had just acquired a new air compressor and that his old one, which he just happened to have in his van, was up for grabs. It was a mongrel put together from a 10-gallon tank and a refrigeration compressor, but it had served faithfully for close to 30 years. "It was free when I got it, and it is free to anyone that wants it."

The lubrication of Bridgeports is a hot topic. They have zerk fittings, which ought to have way oil squirted into them, but many operators are bamboozled (because they are zerks) into lubricating with grease.

Because suitable guns are expensive (if available at all), Don Strang came up with a workable substitute. He took a regular pump oilcan and brazed a female zerk fitting to the tip. This will not work often, because the springs in the zerks on the machine may be too strong. The zerks are made of extremely hard steel and

removing the springs to shorten them is nearly impossible, so Don's solution was to heat the fittings to a dull red (see footnote) and let them cool slowly. This removes the zinc plating, but it softens the spring and the oil-can trick then works very well.

Footnote: To comply with OSHA regulations you **MUST** remove the zerk fittings from the machine before heating. It is neither necessary nor desirable to have the whole Bridgeport red hot.

One more wrinkle: Pump oilcans, like the alcoholically challenged, tend to fall over, so it is advisable to give them a heavy base, preferably larger in diameter than the can itself.

There is a ball fitting in the center of the Bridgeport's table, over the knuckle, for lubrication. Since the vise (or rotary table) is usually sitting over it, it is a pain to keep lubricated, so Don installed another ball fitting 12" away. When the table is moved so that this fitting is over the knuckle, the oiling can be performed without taking the vise off.

Don also found that the Reid surface grinder that he bought recently had been damaged for the same reason - grease had been used for lubrication instead of oil. As a result the leadscrew had been destroyed.

Frank Stauffer solved the Bridgeport lubrication problem another way. He had a tube of light grease in a flexible tube, like a toothpaste tube. He replaced the grease with way oil and fixed the nozzle up to fit the zerk fittings. Jeff DelPapa says that tubes of the sort Frank used are available in bicycle shops.

Larry Keegan wants to know how to build the best possible modular flywheel. This was the cue for Roland Gaucher to pass around a curved-spoke flywheel that he made for another member, on his N.C. milling machine.

Kay Fisher announced that all the scraper kits (book & video) except Bob Cookson's had been picked up. Bob, please get in touch with him.

In reply to a question Ron reported on a substitute for Moglice that he got from Philadelphia Resins. It uses graphite, apparently, whereas Moglice is fortified with molybdenum disulphide. Ron used the substitute resin to rebuild the nuts on his Sherline mill, to take out the backlash, and is quite satisfied with the results. Whereas Moglice costs about \$40 for 2 cubic inches, this stuff costs \$60 for 6 cubic inches. He intends to experiment with mixing graphite with boat epoxy.

Errol Groff brought in more instruction sheets for wigglers because there were not enough to go around last meeting. He also brought in a Starrett center finder and a pamphlet describing it. Don Strang said that he has a Brown and Sharpe equivalent and that neither version is in production any more.

Errol saw a picture of a die-maker's direct-reading micrometer square and has a powerful urge to acquire one of his own. It is a square with a blade that can tilt under micrometer control, so that the degree of tilt of the blade can be read directly off the micrometer head.

Dave Stickler brought in a Stuart Turner #4 steam engine that he is on the verge of finishing. The reversing linkage, made according to the drawing spec does not quite work - it can be made to reverse by fiddling, but there is no smooth transition from forward and reverse (and back again) as there properly should be.

Kay Fisher announced that his lovely wife Patricia now works for the renowned L.S. Starrett Corporation.

Steve Lovely, who recently bought a 16" shaper from a chap in New Hampshire, announced that the same source has a 16" Brown and Sharpe back-gearred shaper for sale at \$50. See him for more details if you are interested. Be aware that this is a BIG, heavy hunk of machinery.

Mike Boucher has an antique book collector friend who had acquired a half-dozen 100-year-old machinery catalogs. Mike bought them and brought them in to show. One of them is a catalogue of a Harris-Corliss steam engine.

Also in the antique publication domain, Don Strang is reading through a collection of "American Machinist" that his friend, club member Bob Hubert, purchased. Some of them date from the time when "American Machinist" was still published in newspaper format, from 1887 to 1892 and a year's subscription was \$3. It became a magazine in 1892 and the subscription rate skyrocketed to \$4. The collection Bob has is not complete; there is a 20-year gap.

An article that took Don's fancy was one on composite metals. Apparently a cast-iron machine base broke in operation and it was successfully recast with steel wire reinforcing. The steel and the cast iron mated very well and the rebuilt unit was highly successful.

Don taped a PBS program, "Stop Watch" about Frederick Winslow Taylor, the inventor of 'Time and Motion study'.

Taylor (the son of a wealthy Philadelphia family of Quakers) also improved on air-hardening (high-speed) steel alloys, which were invented by Mushet in England. Mushet got into a patent dispute with Bessemer, the steel mogul, and was bankrupted by lawsuits, and died in poverty. Members can borrow the tape from Don Strang.

Leon Schiff brought in a box full of end-mills with Brown & Sharp tapers, free to anyone who could use them.

Jeff DelPapa displayed a composite poster that he had assembled, of the steam car that the NERDs had built in competition in England.

The featured speaker was a "no-show" so Tom Cross heroically stepped in at the last moment (in the best show-business tradition) and showed a video (and gave a talk) on a Brown Jr. model airplane engine he built from castings which came from Roger Schroeder and are based on historic designs. Modern practice is to use glow-plugs, but Roger's models have spark ignition.

Tom says that the castings were a bit rough and a bit sandy, but the documentation (drawings and machining instructions) is superb and the prices are moderate.

The kit included rough aluminum castings for the crankcase, rear cover, timer, connecting rod and tank top. Tungsten contact points, screws, nuts, venturi material and main bearing material were also provided. All other necessary materials were readily available.

This is the second engine Tom has built from a kit of castings. The first was a kit from California - the Chum Chubb model. Tom saw an ad for it in the newsletter from the Model Engine Maker's Association.

"It was a disaster because I was all at sea" Tom said. "I milled the intake port above the exhaust port - opposite to the way it should be. Also, I did not understand about bypass and drilled the holes wrong and had to plug them up and start over."

After fixing the mistakes, he tried for a year to get it to run. It came down to compression. The leakage past the piston is critical and the cylinder has to be lapped - mere machining is not good enough. Tom made a new piston half a thousandth oversized and forced it into the cylinder with a press and then lapped them together.

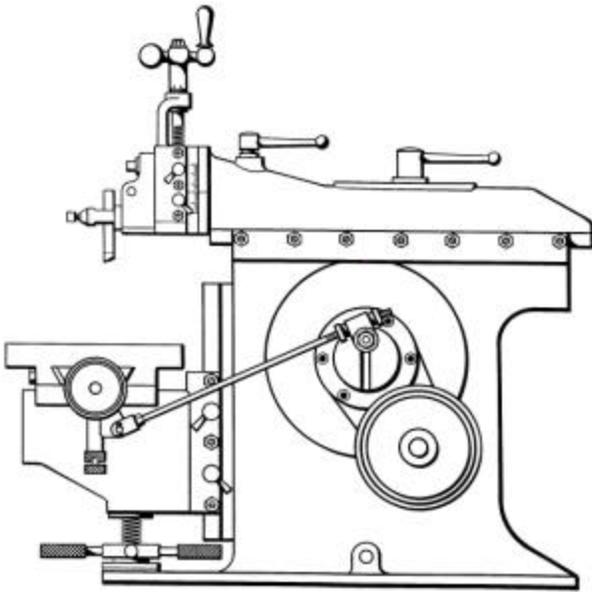
Tom learned the trick of checking the compression by turning the crankshaft until full compression is achieved; to be acceptable the shaft must revert to its former position or close to it when released. After the lapping, Tom tried the test and "the prop sprang back so smartly it nearly took my finger off, so I was happy". Nevertheless, the engine was difficult to start except with an electric starter.

The model shown in the video was slightly off spec, having fewer, thicker fins because the piece of steel Tom used was very hard and difficult to machine.

Tom did a great job as a stand-in and we applaud him.

Roger Schroeder is still in business at 4111 West 98 St., Overland Park, Kansas 66207.

Mb-A



Metal Shapers

By Kay R. Fisher

This month our shaper column takes us to (where else) Vietnam. Howard Evers is one of our members and a fellow shaper enthusiast. During the Vietnam era he was a Marine serving as a bodyguard for the South Vietnamese ambassador Henry Cabot Lodge. Like many servicemen since the recent normalization of relations with Vietnam he had a compelling desire to return to Vietnam. Unlike most of his brethren Howard returned with an interest in small machine shops and tools. And to our benefit he also returned with a keen interest in shapers.

Howard is also directly responsible for my interest in shapers since my first (and favorite) shaper was the result of trading a 7-inch lathe for his 9-inch shaper. So take it away Howard.

Kay

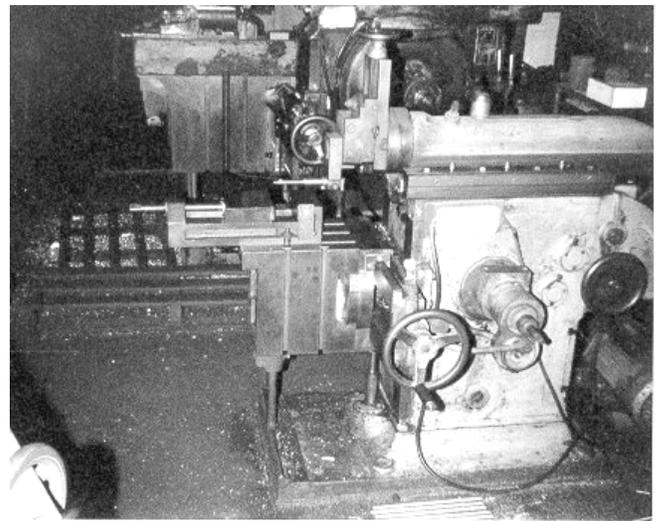
Shapers in Vietnam

By Howard W. Evers

I visited dozens of small (10' x 20') independent machine shops and almost always found a shaper as part of the basic equipment. All were fairly recently (within the past 5 to 15 years) manufactured and all were from mainland China. Almost all of these shops were primitive,

compared to what we have here in the USA, but the work they turn out is first class. There is a tremendous amount of ingenious patchwork done on both small and large engines – e.g. they will literally make Chevy pistons work in a Ford; they will sleeve a sleeve to get the bore they need, etcetera. While I was in a medium sized shop, someone came in with a cardboard box of used pistons from a US military truck. They were to be fitted to another engine of the same make but a different model.

A large, more modern shop I visited was setting up a climate-controlled room for use with a new CNC machining center. He also had about 2-dozen new Chinese lathes as well as a couple of larger Chinese lathes. This shop had two large Chinese shapers. The smaller of the two (in the picture below) was set up to cut key slots in gear hubs.

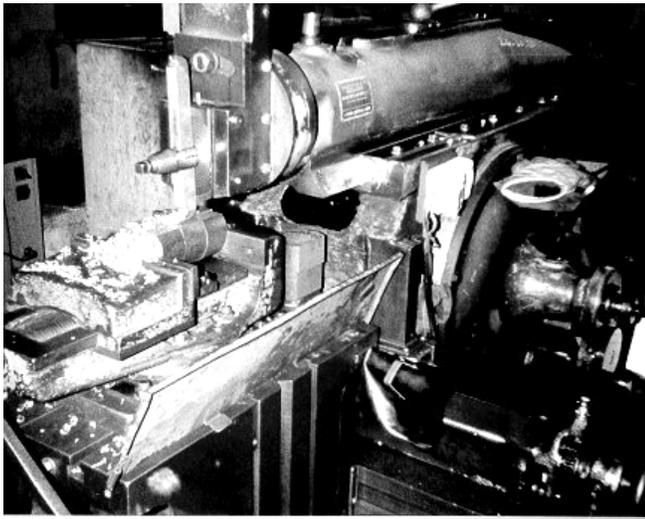


Small Chinese Shaper

Photo by Howard Evers

The larger of the two (in the picture below on the next page), with about a 36" stroke, was used for odd jobs and short production runs.

Note the size of the glove on the right to get an idea of the size of the ram and tool holder.



Large Chinese Shaper

Photo by Howard Evers



Small Machine Shop

Photo by Howard Evers

The picture above is a shot of a typical small shop. Note the absolute lack of basic safety equipment – no safety glasses, open sandals, no shirts, etc.

I have to say that everyone I was in contact with was open and friendly. I had no problems of any kind. I traveled all over and never spoke to another American. I had expected changes, but was unprepared for some of the things I found, like air-conditioned taxis with 2 way radios; air-conditioned, uncrowded buses, and 25 and 30 story buildings all over the place.

Howard

Thanks Howard for that story. Henry Cabot Lodge was ambassador to South Vietnam from 1963 to 1967. He was born in Massachusetts and served as first a state legislator then as a US Senator then as the US representative to the UN before his term as ambassador. The war peaked in 1968 with nearly 500,000 US forces present. Mr. Lodge represented the US at the Paris peace talks. A peace agreement was reached in 1972 and the US forces started withdrawing. After the peace settlement Mr. Lodge went on to be the ambassador to West Germany.

My friend at work and table tennis partner Tai Man is from Vietnam and gave me some additional background information. The last picture was probably taken in the “China Town” district of Saigon. The Chinese sign on the back wall would not be in a normal Vietnamese shop. The Vietnamese use the French alphabet. The sign means good luck. Also there is a temple on the floor behind the operator standing with the bare chest and gray pants. Inside the temple is a small statue of a sitting Buddha. This is also for good luck in all things including business, safety.

Whereas shapers are considered obsolete and consequently inexpensive or free excess in the USA they are valuable machines in Vietnam. In the USA machine shops are more frequently called upon to manufacture many like items and throughput is the number one concern. Small shops must produce goods rapidly to be competitive. In Vietnam labor is cheap and they spend time in machine shops making one-off parts. There is a large problem with availability of spare parts. So if a part for your car breaks it is cheaper to repair or remanufacture that part than to obtain a replacement part. A small machine shop with inexpensive (non-CNC) machines can make a one off part cheap. Tai speculates that one could make good money gathering up all the nearly free large shapers and shipping them to Vietnam. He says that is being done today for obsolete construction machinery. The cost to ship a large (6,000 lb) shaper to Vietnam from Boston would be around \$500 and the value in US dollars to a machine shop would be nearly \$4,000 in Vietnam. For the sake of us collectors and

restorers of old rusty iron I hope nobody ever starts doing this.

Kay

For Sale

I have found an old style of grease gun that works very well with way oil. I have 3 used ones available at \$10 each if anybody needs them. If there are more needed I will try to find some more.

I will also bring one to a future meeting so that people can see what to look for if they want to hunt around the flea markets for them.

Jim Paquette
(508) 278-2203

Web Sites of Interest

zerk oil gun

www.metalwebnews.com/howto/oilgun/gunconvert.html

The New England Wireless and Steam Museum

<http://users.ids.net/~newsm/>

The NEMES Gazette

Newsletter of The New England Model Engineering Society

c/o Rob McDougall (Treasurer)

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