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 April 2006 [www.lals.org](http://www.lals.org) Vol. XLI, No. IV

## A Governor from Scratch Part 1

*By Wilbur Wilhelm*

Two of the stationary vertical steam engines at the Los Angeles Live Steamers Railroad Museum Stationary Plant did not have governors. We controlled speed by throttling with a globe valve and the lack of a governor resulted in the speed going up and down with the variation of steam pressure. The load on these two engines is fixed and low. The installation of a governor on each engine would maintain a constant speed and provide improved operational safety.

Not having a source of governors I decided to design one. The following criteria was established for the design:

1. It, of course, must control speed
2. The control speed should be adjustable
3. It should be picturesque
4. In event of drive belt breakage the governor valve should close
5. It would have be built without the benefit of castings
6. It should be corrosion resistant since our engines are not in a totally weather tight area.
7. The size should be appropriate for a two to three HP engine

There are many approaches to governor design. The Gardner design that is installed on two engines uses two balls on a linkage with the central pivot on the ball centerline. The centrifugal force from the balls is resisted by a compression spring on the spindle. The Pickering Co. has the balls attached to individual flexures, which resist the centrifugal force from the balls. These governors typically operated at about 500 RPM for a small engine application. (about 3/4" pipe size). It was felt that having the balls extend beyond the linkage pivot point along with operating the governor at a lower design speed of 250 RPM would meet criteria #3. Many of the older governor designs were of that configuration. The lower design speed results in less centrifugal force available so a 50% increase in force was obtained by using three balls rather than two.

The plug in the valve body was provided for introduction of steam oil for the engine. I concluded it was not the best idea and that supplying oil upstream of the governor would provide governor valve lubrication.

The control valve type selected was a spool configuration with slots. This valve configuration is used in many servo applications and the precision machining capability was available. More on how it turned out later.

The knob on the side of the governor attached to a worm, which drives a worm wheel, accomplishes speed trim. The worm wheel winds up a torsion spring,

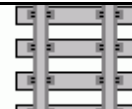
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### Member Calendar

Apr. 3	Board Meeting
Apr. 15	Work Day General Meeting

May 1	Board Meeting
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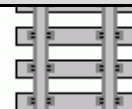
*Board/General Meetings begin at 7 pm.*



### Public Service Schedule

Apr. 2	Public Rides
Apr. 9	Public Rides
Apr. 16	Public Rides Disney Barn Open Steam Plant Open
Apr. 23	Public Rides
Apr. 30	Public Rides

May 7	Public Rides
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## Splinters from the Board

March 6, 2006

By Peter Fuad

The Board voted to approve adding weight to three center bench cars for added stability, and if that works, adding weight to the remaining nine center bench cars.

Safety meetings and testing for Level I were announced for Saturday and Sunday, March 11 and 12.

Todd Moore gave updates on the safety program. Handrails will need to be installed on the O'Brien-Moore Bridge and guard rails in the tunnels. He thanked all those involved in the efforts to date.

Gary Baker presented the new credit card machine.

Bill Donovan gave a presentation on springs for his trucks that will increase their weight capacity.

In other business, new member Frank O'Donnell and his son were introduced.

Confirming an email vote, the Board approved expenditures to repair the tractor fuel pump. The Board decided to defer authorizing the purchase of additional bench cars until the availability of center bench cars and gondolas to haul the public could be more definitively determined.

Don Frozina announced that the Holiday Banquet was set for December 23 at Genios in Burbank.

Steve Harris reported that 342 members have paid 2006 dues to date. He also reported that two additional tracks became available for next year, and they were offered to the next two people on the list from the drawing last month. If either of these two new people decline the tracks, they will be offered to the next people on the list.

## General Meeting Highlights

March 18, 2006

By Donald Frozina

The meeting was called to order at 7 pm by President Donald Frozina.

Don previewed the agenda for the evening: review of the last BOD meeting, questions and answers, adjournment, refreshments and then watching some railroad videos.

Don reviewed the March 6, 2006 Board of Directors meeting with some amplifications. Concerning handrails on the plate/deck bridges surrounding the O'Brien-Moore bridge, Don passed around a concept design where the handrail supports are at angles that matches those of the O'Brien-Moore bridge. These handrails are somewhat prototypical, in that the plate/deck bridges look like they were reinforced for heavier traffic. Gussets were discussed to minimize potential pinch points.

Both the Travel Town N'Scalers (for July 8) and the Toy Train Operating Society (for August 12) were approved and members will be needed to staff these events.

Don also reported that through the tireless efforts of Shira Bush, the Annual Holiday Party and Officer Installation will be at Genios in Burbank on December 23.

Two additional Phil West Barn tracks had become available. Pursuant to the lottery held at the last General Member Meeting, the next persons in line were offered leases. Both tracks were quickly picked-up.

John DePhillip Sr. requested and then took the podium and asked some questions about whether or not the City had sent LALSRLM a letter suspending our operations. Director Todd Moore spoke up and assured John that the City had.

The meeting adjourned at 8:15 pm.

### Los Angeles Live Steamers Railroad Museum Engine Booster

The *Engine Booster* is the monthly publication of the Los Angeles Live Steamers Railroad Museum, a non-profit 501(c)(3) organization. Museum/tracks are located in Griffith Park, 5202 Zoo Dr., Los Angeles, CA. Mailing address: PO Box 2156 Toluca Lake, CA 91610.

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### Los Angeles Live Steamers Railroad Museum Board of Directors 2006

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Todd Moore  
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FROM THE **General Superintendent**

By Tom Downing



Hey! We are back! LALSM is up and running.

Thanks to everyone that helped get the track back in shape. There was a core group of members namely Rory Hawkins, Rob Lamont, Todd Moore, Mike Romanucci, Leonard Evans, Bill Gomez, Doug Ward and the track crew of Skeet Simpson, Doug Young and the DePhillips. John DeRosa and Chris Mahony worked a lot on both 1.5 and the 1 inch track and crossing grids and, of course, Mel Bresee, Ted and Jenny Berg, who just quietly go along working on projects at the Museum. I'm sorry if I missed your name, but if you came out to work it was very much appreciated by all.

If you come out and are looking for a project to work on, I will have a new list in the *Who's Been Workin' on the RR* book by the gazebo phone. There are still a lot of things to do, namely railings at the west-end bridge, main line, yard track work and last, but not least, the valley track and drainage.

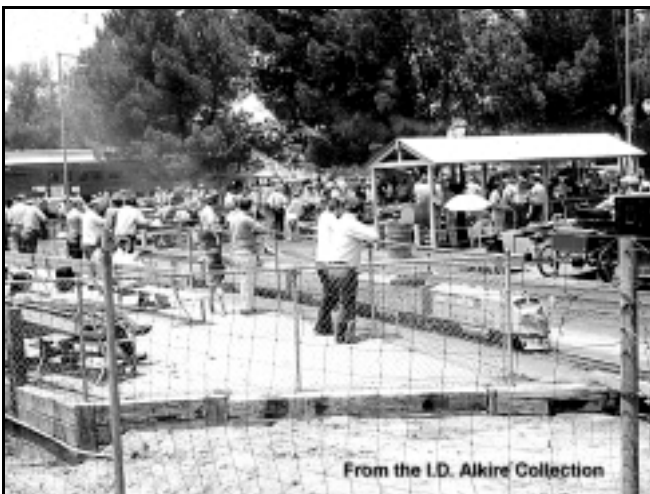
If we can get some dry weather we can really get rolling on these projects. Thanks to David Lazarus for getting those "teensy" patio heaters working. These are great on cool times at the Museum. Please just remember to turn them off before you leave the patio area.

As always, please remember to fill out the pink time card if you are trying to get shed credit.

## Remember When...

By Doug Alkire

Looking Northwest at the public viewing area and infield activity at LALS during the 1975 IBLS Meet.



## President's Message

By Donald Frozina



I want to thank all of you that came out and helped over the last couple of months in getting us re-opened! Over 28 individuals put their names down in the *Who's Been Workin' on the RR* book since last December. I know that many more came out and helped, but didn't write their names down. Again, thank you all.

If you'd like to help out with the public operation, (engineer, conductor or station assistant) you need to have passed Level I certification. (The positions of station master and safety coordinator, which require even more training, will be taken by Level I certified members of the BOD/Safety Committee/Advisory Committee for the next few weeks.) Additional classes for Level I (personnel) certification will be held the third Saturday of the month at 10 am (Level II) and at 2 pm (Level I). Level II certification is a prerequisite for attending the Level I class.

We still have much more to do: Phase III (valley line), Phase IV (trackage not included in Phases I through III), additional Level I equipment certification, the Sutchville track reconfiguration project, etc. Don't be shy, come on out and lend a hand!

(By the way... the *Engine Booster* is about a week late this month, as my family and I went to Flagstaff, Arizona for a week. We rode the Grand Canyon train, went to the Lowell Observatory, and got stuck in a snow storm...)

## Your Last Engine Booster?

By Donald Frozina



If you have not renewed your membership yet, and there is a red dot on the cover of the envelope that this issue of the *Engine Booster* came in, this is your last issue, UNLESS you renew today!

## Kitchen Sign-ups

By Roger Bacon



If you'd like to see the kitchen open on Sundays, you will need to help out and sign-up for kitchen duty. At least three persons are recommended to staff the kitchen so that each one is not over-worked. The kitchen will not be open unless you sign-up and help!

## Who's Been Workin' on the RR

Dec. 18—Mar. 18

Berg, Ginny x7	Gomez, Bill x3	Quinn, Bob x7
Berg, Ted x7	Hawkins, Rory x8	Rnatta, Steve
Bresee, Mel x7	Heiman, Gene	Romanucci, Mike x4
Casey, Michael, Kory & Kyle x4	Lamont, Robert x8	Smith, Dani x9
Clark, Dave x4	Lazarus, David	Smith, John x16
Downing, Tom x19	Mahony, Chris	Tarjany, Ron x2
Emmer, Aaron x3	Moore, Todd, Lisa & Boys x2	Uniac, John
Evans, Leonard x6	Nelson, Ron	Villafana, Henry
Frozina, Don x6	O'Connell, Preston	Ward, Doug x5
		Young, Doug

### A Governor from Scratch *(Continued from page 1)*

which has one arm pushing down on a lever that in turn is connected by slots with the control rod. The torsion spring adds to the load from the main governor compressor spring. The amount of calculated adjustment was about 15%. Unless one wants to have springs made to order you have to use what is available, so results maybe somewhat different from the calculated value.

The belt tightener arrangement is a little unusual. The tightener pulley rides on the outside of the belt, rather than on the inside as is typical. The belt tightener arm axis shaft has a double cam attached that rides over a fitting on the control rod shown in photo #6. With the belt and tightener properly installed the cam does not touch the control rod fitting. A torsion spring is located around the cam/pulley arm shaft housing with one spring arm resting on the governor housing and the other riding on a bolt inserted into the disk attached to the pulley arm shaft. The torsion spring is wound up enough that with governor stopped it will overcome the governor main spring and force the valve closed. Twenty holes were drilled and tapped in the disk to provide plenty of adjustment for the tightener pulley arm and the wind-up of the torsion spring.

*(Continued next issue)*

## G Gauge "Harvest Garden" Help Needed

*By Mike Houston*

Descanso Gardens has something called the "Harvest Garden". Lew Soibelman has some interest in Descanso and when they asked him for help, he volunteered me. It will be on April 18<sup>th</sup> through April 22<sup>nd</sup>.

The "Harvest Garden" is a section of land that is used to show special needs students that they really can do things. They plant, pull weeds, water and harvest things that they "made" themselves.

This is a pretty standard "run a train and answer questions" event. It lasts from late morning to early afternoon each day. We need people to put the trains down in the morning, watch them during the day and pick them up in the afternoon. Descanso will have a room in which to store them during the night.

There is a large roofed meeting area where Descanso will set up four tables and four sheets of 4' x 8' plywood. I plan on screwing down the track on the April 16<sup>th</sup> so there will be minimum operational problems. BUT, I will be in San Francisco on the 17<sup>th</sup> through 19<sup>th</sup>, and they will be displaying their work on April 18<sup>th</sup> through April 22<sup>nd</sup>. Call me at 818/845-1116 if you can help out!

## Training Classes

**Safety:** Level II (private use), 3<sup>rd</sup> Saturday at 10 am. This is a half-hour class with a multiple choice test. Level I (public operations), 3<sup>rd</sup> Saturday at 2 pm. This is an hour class with a multiple choice test. (Level II is the prerequisite for Level I.)

**Conductor:** Want to learn to be a conductor? Call Roger Bacon at 818/887-0898 or Steve Harris at 818/842-2296 to schedule a class.

There is an excellent DVD available to either borrow or own (\$5). The conductor class typically meets on a Saturday. Note: You must have completed both your Level II and Level I safety training to attend this class.

**Diesel Engineer:** Want to learn to operate the organization's diesel/electric locomotives? Call Roger Bacon at 818/887-0898 or Gary Burdorf at 310/573-2019 to schedule a class. The diesel class typically meets on a Saturday with the Check Ride on the following Sunday. Note: You must have completed all your conductor requirements to attend this class.



## For Sale

**3/4" Tich**, unfinished, all parts there. Best offer. Contact Ross Crawford, 916/718-4162.

**Electric Locomotive**, 6' Cannonball Steel Gondola, Mountain Car Metal Caboose. All are in near perfect condition. \$4,000 for everything.

All items are sold as-is. Everything to be sold as grouped above. Contact Jay Carsman for more information, 818/727-1111, or send an email to [jcarsman@socal.rr.com](mailto:jcarsman@socal.rr.com).

**Allen 4-6-0 Machined Kit.** All machine work is complete. Comes with finished boiler and fiberglass tender tank. Asking \$11,500.00 or make an offer. Contact Bill Barbe, 818/325-9227.