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A journal of transport timetable history and analysis

The Disappearing DERM

Inside: Weird timetables (x2)
Chessie the cat among the pigeons
Balranald mystery

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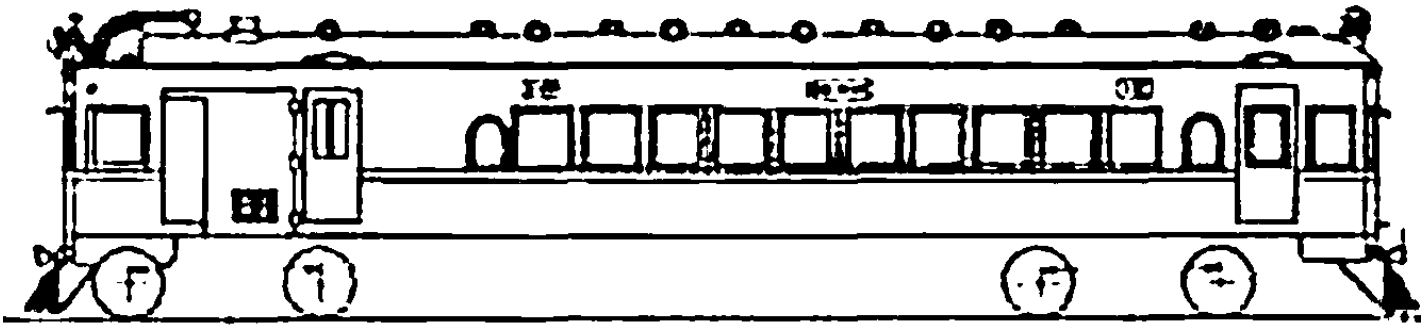
On the front cover

A VR D.E.R.M. trundles into Black Stump country from the junction station of Korong Vale. Sometimes it was days before they came back. In at least one case, as described by Victor Isaacs in this issue, a DERM appeared to disappear completely. Read all about it in *Timetable Mystery*, starting on page 3.



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Timetable Mystery

Victor Isaacs stumbles across a multiply-weird timetable in outback NSW.

This article is about one of the weirdest country railway timetables that ever existed in Australia.

It is even a mystery as to whether to classify this article as about Victoria or New South Wales. The Balranald line was one of a number of Victorian Railways lines that extended into southern NSW. It was the longest of these, extending 205 km into NSW. In the early 1920s, interstate jealousies had abated sufficiently that the New South Welsh Government saw the economic sense of allowing the Victorian Railways to build lines in southern NSW, while the NSW Government undertook land development there. The ports of Melbourne or Geelong were twice as close as any ports in NSW. From the junction at Barnes (a station named after a Victorian Minister for Railways but in NSW!) the entire line was opened in one go on 26 March 1926. The line is very flat and uninteresting throughout, but passes through fertile country when irrigated.

For many years thereafter, the passenger service was by slow Mixed train twice a week until this was withdrawn.

In the early 1950s, the VR acquired a fleet of Diesel Rail Cars built by the Walker Company in Britain. These are hardly remembered with affection. They were very rough riding. But, in their favour, it has to be said that they were affordable in those stringent days, and they were available. After they arrived, the VR reintroduced passenger trains on many lines that were hitherto passenger trainless. Some of these re-introductions were unsuccessful and did not last (eg, Dimboola-Rainbow, Murchison East-Rushworth, Shepparton-Katamatite, Numurkah-Picola). Some were successful and lasted many years (eg, Horsham-Goroke). Among the latter is the subject of this article, Echuca-Balranald.

The VR did not publish Public Timetable books from 1941 to 1954! To partially fill this gap, in the early 1950s, they published system-wide, passenger-only Working Timetable books. Illustration one is from the issue of 16 August 1954 and shows the first timetable for the new twice-weekly passenger service to Balranald. I think that the additional weekly train as far as Wakool was for the convenience of a tracklaying gang then working in the area.

Illustration two is from the Public Timetable of 6 May 1968 and shows that the service continued unchanged until then. Sometime in 1968 or 1969, the service was upgraded to be operated by one of the older, but more comfortable, Diesel Electric Rail Motors. But something else happened that was mysterious. Illustration three is from the VR Public Timetable book of 3 November 1969. On the down, only one train now operates through to Balranald. The other train on Mondays now terminates at Moulamein. Yet on the up, there are still two trains from Balranald (although the Tuesday train now operates on Wednesdays instead). How can this be? What possible explanation is there? Was a workshop built at Moulamein to scrap Rail Motors and another workshop built at Balranald to build Rail Motors?

The explanation is perhaps even stranger than this. There was perhaps the most unusual piece of train working ever timetabled in Australia. On Mondays the Rail Motor worked, as they were designed to do, a passenger service from Echuca to Moulamein. Then it rested for 23 hours. On Tuesdays afternoon a goods train from Echuca terminated at Moulamein. The Rail Motor then acted as a locomotive of a goods train to haul goods vehicles further from Moulamein to the terminus of Balranald! Then on Wednesdays, the Rail Motor resumed its normal function of providing a passenger service, returning from Balranald to Echuca. All is explained in the extract from the VR Northern and Midland Working Timetable of 3 November 1969, which is our illustration four.

The use of a Rail Motor as a goods train locomotive was possible because the line was so flat. But why was this done? Why was one passenger train weekly justified to Balranald, but two from? Why was two freight services to Balranald justified, but only one from? The latter point is especially curious because the main traffic on the line would have been outwards grain.

This strange practice continued until passenger services ceased on the Balranald line as from the timetable of 10 November 1975.

13 W.T.T. 60/54

ECHUCA–BALRANALD.

DOWN.		63 PASS. MON., THURS.	47 Diesel Rail Car (102 H.P.) Alternate Fri.	UP.		2 Diesel Rail Car (102 H.P.) Tues., Fri.	
		A.M.	P.M.			A.M.	
MELBOURNE (Spencer Street)	dep.	8 15		BALRANALD	dep.	5 35	...
				Yangalake		5 45§	...
				Impimi		5 57§	...
				Perekerten		6 17§	...
				Berambong		6 33§	...
	arr.	11 20		Moulamein		6 43	...
Bendigo		Diesel Rail Car (280 H.P.)		Dhuragoon		6 59§	...
	dep.	11 55		Niemur		7 8§	...
		P.M.		Jimaringle		7 15§	...
	arr.	1 19		Burraboi		7 27§	...
		Diesel Rail Car (102 H.P.)			arr.	...	...
Echuca				Wakool		Tues., Fri., (Alternate Sat.)	
	dep.	1 40	3 0		dep.	7 43	...
Moama		1 46*	3 6*	Yallakool		7 57§	...
Barnes		1 58	3 18	Caldwell		8 11§	...
Benarca		2 11§	3 31§	Tantonan		8 24§	...
Womboota		2 22§	3 42§	Bunnaloo		8 37§	...
Thyra		2 33§	3 53§	Thyra		8 48§	...
Bunnaloo		2 45§	4 5§	Womboota		8 59§	...
Tantonan		2 58§	4 18§	Benarca		9 10§	...
Caldwell		3 11§	4 31§	Barnes		9 30	...
Yallakool		3 25§	4 45§	Moama		9 41*	...
Wakool	arr.	...	5 5	Echuca	arr.	9 47	...
	dep.	3 42				Diesel Rail Car (280 H.P.)	
Burraboi		3 57§			dep.	10 13	...
Jimaringle		4 10§			arr.	11 30	...
Niemur		4 17§		Bendigo		PASS. noon	
Dhuragoon		4 26§			dep.	12 0	...
Moulamein		4 44		MELBOURNE (Spencer Street)	arr.	P.M. 2 25	...
Berambong		4 54§					
Perekerten		5 10§					
Impimi		5 30§					
Yangalake		5 42§					
BALRANALD	arr.	6 0					

Commencing Friday 6/8/1954.

Commencing Saturday 7/8/1954

BALRANALD

		Pass. Mon. Thurs.
MELBOURNE		a.m.
(Spencer Street) ...	*dep.*	8 10R
(See page 34)		
	arr.	11 15CR
BENDIGO ...		Rail mtr.
(See page 34) ...	*dep.*	11 50
		p.m.
	arr.	1 19C
ECHUCA ...		
(See page 34)		Rail car
	dep.	1 40
Moama	...	*
Barnes	...	1 57
Womboota ...	...	2 16§
Thyra	...	2 26§
Bunnaloo	...	2 37§
Tantonan	...	2 49§
Caldwell	...	3 0§
Yallakool	...	3 15§
Wakool	...	3 31
Burraboi	...	3 45§
Jimaringle	...	3 59§
Niemur	...	§
Dhuragoon ...	...	4 17§
Moulamein ...	...	4 39
Perekerton... ...	...	5 12§
BALRANALD ...	*arr.*	6 0

		Rail car Tues. Fri.
		a.m.
BALRANALD	*dep.*	5 30 ...
Perekerten	...	6 12§ ...
Moulamein ...	...	6 45 ...
Dhuragoon ...	...	7 2§ ...
Niemur ...	...	7 12§ ...
Jimaringle ...	...	7 20§
Burraboi ...	...	7 33§ ...
Wakool... ...	...	7 50 ...
Yallakool ...	...	8 3§ ...
Caldwell ...	...	8 16§ ...
Tantonan ...	...	8 27§ ...
Bunnaloo ...	...	8 39§ ...
Thyra	...	8 50§ ...
Womboota ...	...	9 0§ ...
Barnes	...	9 23 ...
Moama	..	* ...
	arr.	9 45C ...
ECHUCA ...		
(See page 36)		Rail car
	dep.	10 5 ...
	arr.	11 30CR ...
BENDIGO		Pass.
(See page 36) ...		Noon
	dep.	12 0 ...
MELBOURNE		p.m.
(Spencer St.)	*arr.*	2 25R ...

MOULAMEIN, BALRANALD

		Pass. Mon. Thurs.
MELBOURNE		a.m.
(Spencer Street) ...	*dep.*	8 10R
(See page 34)		
	arr.	11 15CR
BENDIGO ...		Rail mtr.
(See page 34) ...	*dep.*	11 50
		p.m.
	arr.	1 19C
ECHUCA ...		
(See page 34)		Rail mtr.
	dep.	1 40
Moama	...	*
Barnes	...	1 57
Womboota ...	...	2 16§
Thyra	...	2 26§
Bunnaloo	...	2 37§
Tantonan	...	2 49§
Caldwell	...	3 0§
Yallakool	...	3 15§
Wakool	...	3 31
Burraboi	...	3 45§
Jimaringle	...	3 59§
Niemur	...	§
Dhuragoon ...	...	4 17§
	arr.	4 35
MOULAMEIN ...		Thurs.
	dep	4 39
Perekerton... ...	...	5 12§
BALRANALD ...	*arr.*	6 0

		Rail motor Wed. Fri.
		a.m.
BALRANALD ...	*dep.*	5 30 ...
Perekerten ...	...	6 12§ ...
MOULAMEIN	...	6 45 ...
Dhuragoon ...	...	7 2§ ...
Niemur ...	...	7 12§ ...
Jimaringle ...	...	7 20§
Burraboi ...	...	7 33§ ...
Wakool... ...	...	7 50 ...
Yallakool ...	...	8 3§ ...
Caldwell ...	...	8 16§ ...
Tantonan ...	...	8 27§ ...
Bunnaloo ...	...	8 39§ ...
Thyra	...	8 50§ ...
Womboota ...	...	9 0§ ...
Barnes	...	9 23 ...
Moama	...	* ...
	arr.	9 45C ...
ECHUCA ...		
(See page 36)		Rail mtr.
	dep.	10 0 ...
	arr.	11 30CR ..
BENDIGO		Pass.
(See page 36) ...		Noon
	dep.	12 0 ...
MELBOURNE		p.m.
(Spencer St.)	*arr.*	2 25R ...

ECHUCA–MOULAMEIN–BALRANALD (N.S.W.).

Down. **Passenger Service.** **Goods Service.**

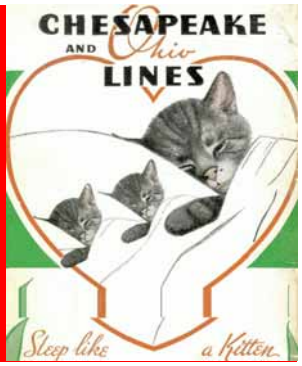
Miles	STATIONS		67 PASS. MON., THUR.	79 Diesel Electric Rail Motor (Empty) Hauling Goods Vehicles (See Note) TUESDAY	29 Goods Tue.	119 Goods Fri.	
			A.M.	P.M.	A.M.	P.M.	
—	**MELBOURNE** W	*dep.*	8 10	...	...	...	...
		arr.	11 15**C**	...	...	...	...
			Diesel Electric Rail Motor and Trailer				
100¾	**BENDIGO** W ...						
			A.M.				
		dep.	11 50	...	3 0	...	...
			P.M.				
		arr.	1 19**C**	...	6 50	...	...
			Diesel Electric Rail Motor				
155¼	**ECHUCA** E S W ...					—**114**	
		dep.	1 40–**65**	...	8 45	2 30	...
156¾	Moama E S ...	*arr.*	...	...	...	...	...
		dep.	1 46*	...	8 52	2 38	...
162¾	*Barnes* E S † ○ ...	*arr.*	...	...	9 5	2 53	...
		dep.	1 57	...	9 15	3 3	...
173½	Womboota N C		2 16§	...	...	...	...
178½	Thyra N C		2 26§	...	...	...	...
183½	Bunnaloo N C ...	*arr.*	...	...	10 25	4 15	..
	(See note, page 35)	*dep.*	2 37§	...	10 45	4 30	...
189¼	Tantonan N C		2 49§	...	...	...	...
195	Caldwell N C (See note, page 35)	*arr.*	...	...	11 20	5 5	...
		dep.	3 0§		11 30	5 15	...
201½	Yallakool N C		3 15§	...	P.M.	...	...
208	Wakool † ...	*arr.*	...	...	12 5	5 55	...
		dep.	3 31	...	12 55	6 50	...
215	Burraboi N C (See note, page 35)	*arr.*	...	...	1 15	7 10	...
		dep.	3 45§		1 35	7 30	
222½	Jimaringle N C		3 59§	...	...	...	...
226½	Niemur N C (See note, page 35)		§	...	2 10	8 15	...
231½	Dhuragoon N C		4 17§	...	...	...	...
241¾	**MOULAMEIN** † W	*arr.*	4 35	...	3 0	9 0	...
			THUR.				
		dep.	4 39	3 40–**29**	———	10 5	...
258	Perekerten N C (See note, page 35)	*arr.*	...	4 20	...	10 45	...
		dep.	5 12§	4 30	...	11 5	...
						Sat.	
						A.M.	
282½	**BALRANALD** W †	*arr.*	6 0	5 45	...	12 5	...

C. Change trains.

Note:—Permission is granted for a maximum of three goods vehicles to be trailed behind the Diesel Electric Rail Motor between Moulamein and Balranald subject to the aggregate tonnage of the vehicles not exceeding 60 tons.

Cats among the pigeons

Chessie the cat and her kittens sure stirred things up, as these Letters from **DEREK SCRAFTON, JIM O'NEIL, DEAN OGLE and ALBERT ISAACS** *reveal.*



DEREK SCRAFTON:

I enjoyed Albert's article about the Chessie timetables, but have a correction to the last paragraph. Chessie was never part of Conrail, its successor CSX was one of the two companies that effectively shared most of the Conrail system when it was sold, the other being Norfolk Southern.

The six bankrupt companies that were absorbed into Conrail were: Penn Central (former NYC, New Haven, Pennsylvania), Lehigh Valley, Reading, Lehigh & Hudson, Central New Jersey, and Erie Lackawanna. Ref: Orenstein, J.: United States Railroad Policy. Nelson Hall 1989.

JIM O'NEIL:

There's been a mistake in Albert Isaacs' article on Chessie the cat, on page 8 of the June 2008 Times. The Chessie system did not become part of Conrail in 1973. Only railroads going into New York City or New Jersey were shoved into the Conrail grab-bag when most north eastern railroads went bankrupt. A few others, like the Boston & Maine, also became bankrupt, but ended up in private hands, in the Guildford system (now Pan Am, of all things!) Chessie, as a Pocahontas coal road was never in danger of bankruptcy, and never came closer to New York City than Washington D.C. It's subsidiary, the Baltimore & Ohio got as close as Philadelphia - its line to New York via Bound Brook was no longer owned by 1973. In fact the Chessie was one of the railroads the government tried to have take over some of the bankrupt lines to keep Conrail down in size - but no agreement could be reached with the Unions over job security.

Albert is right, however, to say that Chessie is now part of CSX. The C stands for Chessie, the S for Seaboard System (also known as "the Family Lines") and the X for something extra as a result of the merger. Roughly half of Conrail has now been taken over by CSX.

Also, late in WWI the U.S. government took over and operated nearly all the railroads in the U.S.A., so Conrail was not "one of the very few railroads to have been operated by the federal government". Very few of them hadn't been, at some time or other.

If we want to be a journal of record, we should set the facts straight.

DEAN OGLE:

Regarding Albert's article "Chessie the Cat, at three years old" in the June issue of The Times, apparently some of the timetables Albert refers to didn't get included in the printed copy, which makes it very difficult to follow along. As luck would have it, I have an August 1936 issue of The Official Guide of the Railways on CD and so I could make some sense out of it.

To comment on Albert's questions,

Why does the advert on The Times' page 3 feature silhouettes? Albert's answer doesn't answer the question. I can only suggest that the layout looked good to C&O's publicity people, or to their advertising agency, or whoever put it together. The gentleman facing right is obviously George Washington, but I have no idea as to the person with what seems to be a beard or goatee.

As to Questions 3A and 3B, how many rail motors were required to operate the service on Table 12, Albert suggests three; one operating trains 12 and 9 on a given day, a second operating 33 and 32, and a third operating 10 and 11. If trains 9, 10, 11 and 12 ran daily this would work, but they don't, and it doesn't.

If the depot is at Lynchburg, the sequence repeats every two days. On Monday, Car A operates trains 12 and 9, followed by 10 and 11 on Tuesday, and the same again on Wednesday-Thursday and Friday-Saturday, where the car arrives Lynchburg at 1020 PM. The next day is Sunday, and Train 12 doesn't operate – so there's no equipment at Richmond to form Number 9.

The other half of the equation, Car B, would start from Clifton Forge on Monday, run to Richmond as Number 10, then return as Number 11 to Lynchburg where it would form Numbers 12 and 9 on Tuesday, returning to Clifton Forge. This pattern also repeats Wednesday through Saturday. On Sunday the car is available to operate daily train 10, but there's no return to Lynchburg because Train 11 doesn't operate on Sunday.

So on the second Monday morning, Car A is at Lynchburg to form Trains 12-9 and Car B is at Richmond. Sunday's Train 9 didn't operate and there's no Car at Clifton Forge for today's Train 10. The passengers aren't going to be happy.

I understand that Australian railways believed in punctuality. I'm not so sure that was the case in North America. I'm not suggesting that Chessie deliberately set out to run off schedule in 1936. But I know nothing about this line – what kind of signalling (if any) did it have? How busy was it? I wonder how reliably Train 12 could run 147 miles from Lynchburg to Richmond, unload, reload, and be ready to depart on time as Number 9, just twenty minutes later. Even more so for Train 10, running 231 miles Clifton Forge to Richmond and then turning right back for another five-hour run within 25 minutes.

We would need to see C&O equipment utilization records to be positive, but I wonder if the main depot isn't at Richmond and four motors are in use: two based in Richmond alternating daily as Trains 9 and 10, and two operating out of a minor depot at Lynchburg as 12-11 and 33-32.

As to the drivers (Question 3C), without some additional information there's really no way to be positive 72 years after the fact. A Richmond driver could have run between that point and Lynchburg, with a driver based at the latter place continuing on to Clifton Forge. Or, depending on the way seniority and crew districts were set up, drivers based at Lynchburg could have run to both Richmond and Clifton Forge and return. As these runs were relatively short, time-wise, at 8.5 hours, perhaps an arrangement allowed the driver to run through between Richmond and Clifton Forge. (US federal law at this time allowed operating crews to be on duty for 16 continuous hours.) Railroad crew districts started out small, then got larger as motive power improved and trains ran faster. Traditionally, seniority districts matched operating divisions but as divisions were combined (usually to reduce expenses), a seniority district might get split over two divisions. The railway and the union would

have to agree on a solution. Sometimes, the seniority district would be realigned to match the new operating division, with the men making whatever choices they had according to seniority. In other cases, a "pool" would be set up, with say 65% of the miles to be run over a given territory assigned to men from seniority District A and the other 35% going to District B. We need to see the applicable union agreements to be certain.

Stating that a driver could have started in Lynchburg on Train 12 and got off Train 9 at Strathmore, thereby having an exact 8-hour shift, is merely playing with the timetable. Drivers of passenger trains normally start their duty 45 to 60 minutes before the train departs, to give them time to sign in, read the notices, check over the engine (or motor) if the train is originating, and so forth. At their terminal they receive additional time for work performed in the course of going off-duty. It's extremely unlikely the union would have agreed to a shift that tied up at an intermediate point; if a job couldn't get back home in one shift, it almost always tied up at the turn-around point and came back the next day.

Again, not knowing anything about operations on this line, if the branches working out of Balcony Falls and Strathmore brought large quantities of coal out to the main line, there might very well have been terminals at those points, with crews assigned. Or, with 16 hours to work, a crew might have been ordered out of Lynchburg or Richmond to run to Balcony Falls or Strathmore, run out the branches, and return. The railroad would have come up with a plan that balanced providing the most revenue and the least expense, and they would be tweaking it continually in response to ever-changing conditions.

Question 5, Table 36 (Times page 6), there were loco-hauled and rail motor services between St Albans and Sproul at practically the same times because at Sproul the line divided into the branch to Sharples (shown) and another to Whitesville (which wasn't). Each branch was long enough so that making a sidetrip from Sproul was impractical. Facilities may not have existed at Sproul such that a train out of St Albans could have split at that point, and combined in the afternoon. Or, since two crews are obviously required, even if facilities did exist Chessie may have decided it was just plain easier to operate two trains. Who knows?

Incidentally, Table 37 may not have had train numbers for the Whitesville line, but the Official Guide did. Numbers 218 and 219 were Trains 224 and 225 between Seth and Prenter. And in the Official Guide, trains 214 and 215 ran two miles past Sharples, to Monclo. According to the directory of stations, Monclo was shown on Table 41. Albert wonders about the layout of this C&O timetable, and I have to agree.

Albert asks in Question 7, what problem was caused by Trains 50 and 51 at Lorado (the one-minute turnaround). All three trains arriving at this point do the same, and there are many instances of zero, one and two-minute turnarounds shown in both the timetable and the Official Guide. Many of these "towns" were nothing more than mine loadouts and a few houses, a store and a post office, all located deep within a very narrow valley. Did they even have passing tracks, or run-around tracks, or a wye (triangle)? They'd have to be clear at the times needed by the passenger trains, a possible operational headache. Could the trains have backed out (or in)?

As to the Directory of Stations, this was probably a cost-cutting move by the Passenger Department. Remember, the Depression was still in full force. Traffic to and from these places was probably pretty light, and Chessie probably saved a page or two in the timetable by listing them in this manner. Some of these places still had service, while others didn't. For instance, Pecks Mill and Peach Creek aren't shown in Table 14 but they are in the Official Guide. Peach Creek was a regular stop and Pecks Mill a flag stop, both for all trains.

Upon re-reading this massive missive, it seems like I'm taking issue with Albert at almost every turn. It's not intended that way; I'm attempting to analyze the available information from my North American viewpoint and, where I can, suggest alternative explanations. What we really need is a Chesapeake & Ohio expert!

Finally, I'd like to thank Albert for opening this can of worm --- er, I mean, writing this article, and The Times for printing it. I can envision rail motors and one-or-two car trains, running up and down obscure branches and spur tracks, continually twisting and turning, following the rivers, poking into tiny communities deep within narrow valleys, delivering people, mail and express. I would have liked to have seen it.

PS: ***Sleep like a Kitten and Arrive Fresh as a Daisy***? Makes perfect sense to me!

ALBERT ISAACS:

I certainly understand the problems that are often faced by editors, particularly when it comes to interpreting the wishes of contributors; it's often a thankless task! That being said, I am quite intrigued by some of editing decisions in the presentation of my article, Chessie the Cat, at three years old ("The Times", No.291, June 2008).

The TT map did not appear amongst the illustrations. I would think it would have been necessary for readers to consult a map so as to understand the system. The answers to a number of the questions, particularly 3C, were difficult to interpret without the map. By using a layout of the illustrations which did not necessarily increase the size of some tables and which deleted some of the fillers (e.g. the C&O logos) and the tables not referred to in the text, it should have been possible to include the map without the article taking up more space. [Sorry for that, Albert.... I've squeezed it into the centre-spread of this issue– Geoff Lambert].

The answer to question 5 was, unfortunately, difficult to understand without the inclusion of Table 37. [*Mea culpa*... It too is now in the centre-spread].

Similarly, question 6 became somewhat incomprehensible without one being able to reference Table 17. [*Mea maxima culpa*.... Ditto]

Question 3 actually commenced at the last para of column 1, page 3, not the second para of column 2, page 3. Your layout makes the last para of column 1 look like part of question 2 but most readers would have had difficulty in understanding why the para is there. Similarly, in the format used, people may not have understood to what table question 3 actually referred.

Yet another problem arose by placing the full article in one typeface rather than putting the questions in a different font, as per the copy I sent to you. The last paragraph of the article appears to be associated with the answers to the questions whereas, in reality, it's part of the body of the article.

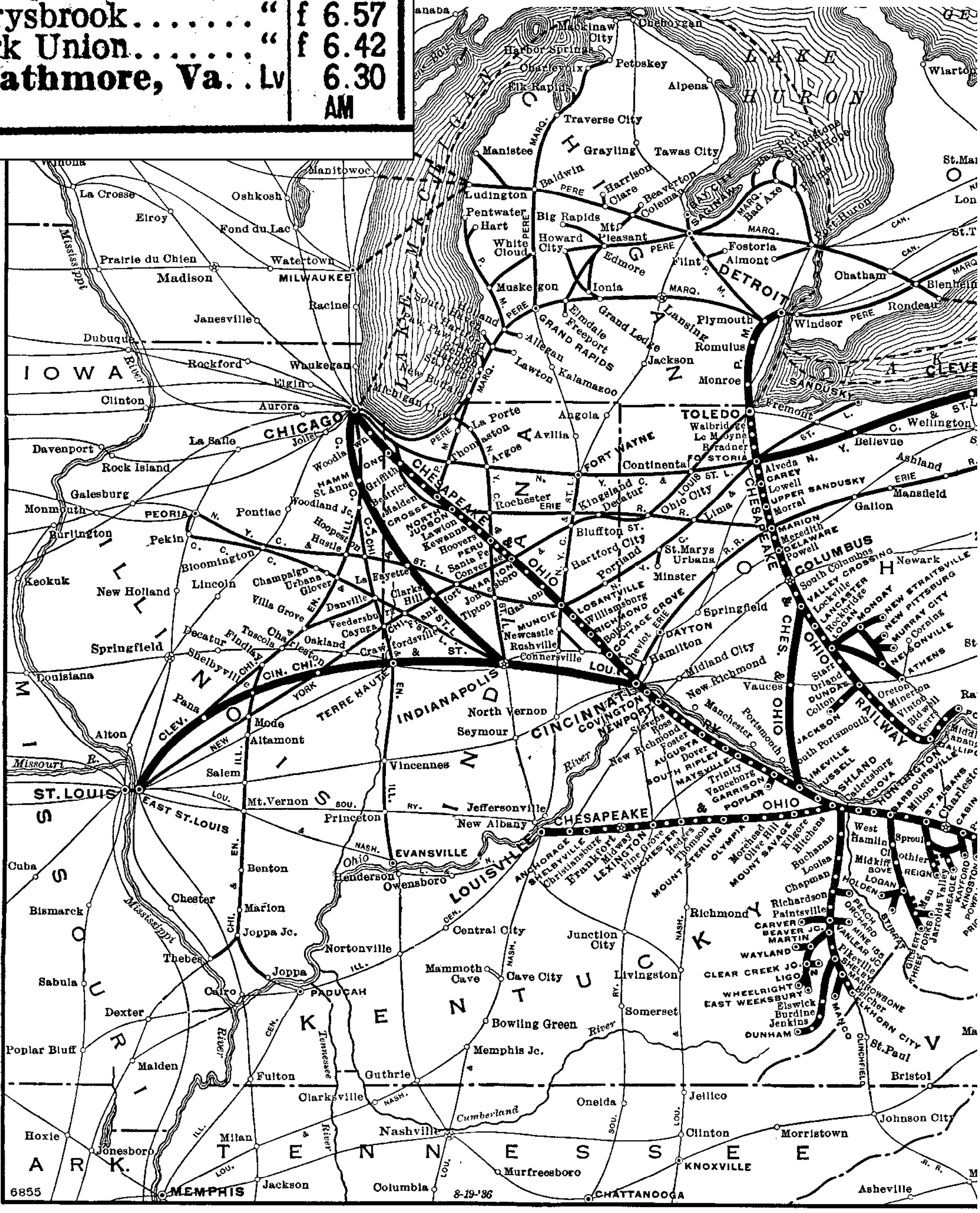
Question 1 deals with the FFV and, helpfully, you refer readers to the illustration to the right of the question. Did you consider similar references to the other tables referred to in the text?

That being said, I can see from some of the feedback that the article has been of interest to a number of readers. I certainly appreciate readers correcting the recent history and informing us that C.&O. was not actually part of Conrail.

Congratulations on the job you're dong as editor of the A.A.T.T.C's historical journal. As the founder of "The Times" and its editor for over 20 years, I still retain an ongoing interest in the magazine and look forward to contributing again in the future.

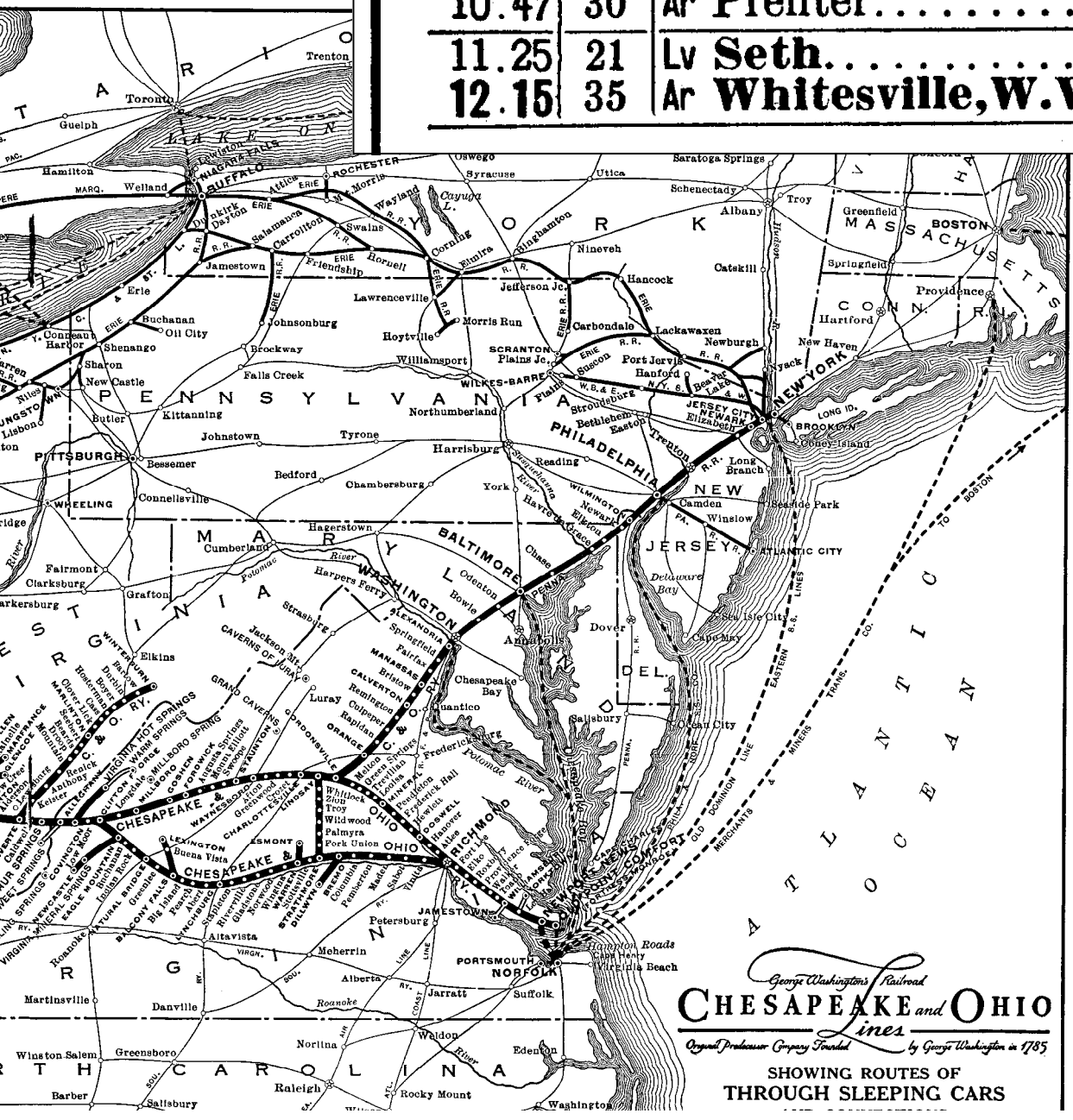
VIRGINIA AIR LINE BRANCH

405 Mixed Ex. Sun.	Mls.	Table 17 (*Eastern Time*)	402 Mixed Ex. Sun.
PM			AM
3.30	....	Lv **Gordonsville, Va.**. Ar	8.15
4.02	0	" Lindsay Lv	8.05
f 4.16	7	" Zion .... "	f 7.35
f 4.23	10	" Troy .... "	f 7.25
f 4.30	14	" Wildwood .... "	f 7.16
f 4.36	17	" Palmyra .... "	f 7.08
f 4.44	21	" Carysbrook .... "	f 6.57
f 4.54	25	Lv Fork Union ...... "	f 6.42
5.02	29	Ar **Strathmore, Va.** .. Lv	6.30
PM			AM



SPROUL—WHITESVILLE

Daily	Mls.	Table 37	Daily
AM		(*Eastern Time*)	PM
8.59	0	Lv **Sproul, W. Va.** Ar	3.24
9.05	2	Ar Brounland Lv	3.18
f 9.25	10	" Brushton "	2.53
10.02	14	" Peytona "	2.14
10.20	21	Ar **Seth** Lv	1.54
10.47	30	Ar Prenter Lv	10.48
11.25	21	Lv **Seth** Ar	1.54
12.15	35	Ar **Whitesville, W.Va.** Lv	12.50



The Inventive Mind

Bright and not-so-bright timetable ideas from the US Patent Office, uncovered by Geoff Lambert

What's a timetable?" You know the answer to this—I hope. The passer-by who asked John Wilkins and me this question at the NAOTC Convention in 2006 didn't. He was a man of the 21st Century. A man of the 19th Century would not have had to ask.

When railways dominated the world they penetrated the consciousness of everybody to an extent that is hard to appreciate now. Even Granny stopped to watch the trains go by. Everything associated with trains was a matter of interest, timetables not the least. Sherlock Holmes kept a copy of Bradshaw on the mantelpiece and the USA Official Guide was the largest monthly periodical on the planet. *Bradshaw* was so popular that it mutated from adjective to noun in its first decade. According to Carlos Schwantes in *The Joy of Timetables*, "as an object of popular culture, the timetable had few peers". They were the trivia of existence- the warts and moles of life.

The timetable and even the word "timetable" (originally "time table") were inventions of the early days of railways, circa. 1840. *Timetable* was a neologism coined to standardize the existing diverse systems of "arrangements" or "schemes". One had to look in the local newspapers to find these. Or on the walls of stations. Some bright spark reasoned that they could be turned into mass-circulation objects—to carry home in your pocket, use and throw away. Standards evolved and became accepted. Everybody could recognise a timetable as a timetable,

But not everybody was impressed. Some people found timetables confusing and sought something better. They patented their ideas. It was a natural thing to do in an era when the timetable was an instrument of daily life. It was like patenting a new kitchen gadget.

I had known about patent search engines on the *World Wide Web* for some years, but it wasn't until recently that it occurred to me to feed "timetable" into Google Patents. A surprising number of patents popped up instantly. The United States Patent Office registered the majority. Most were products of the 19th Century but they are still being patented in the 21st, especially in Japan. Here then, are a few samples.

1. Timetable rack

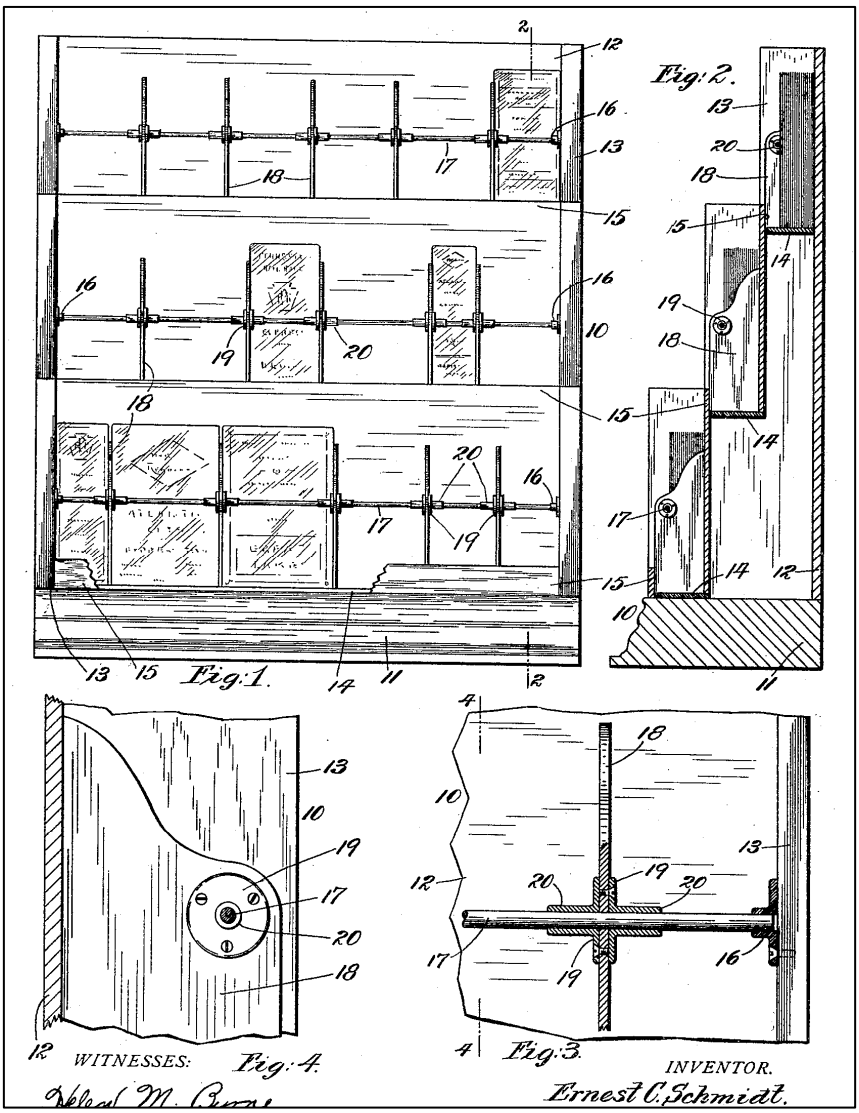
Timetables did not "sell" themselves. They needed to be sold, especially when and where they proliferated. The timetable rack was part of this "sales" process. Racks made choosing the right timetable easy for passengers. Search Flickr for "timetable" and the majority of the 4,000 images which pop up will be timetable displays. A goodly number of these will be the traditional rack- serried ranks of paper timetables available for the taking.

A timetable rack seems to be a simple enough structure, hard to get wrong. But Ernie Schmidt thought it could be improved. His idea, in USA patent No. 1,117,255, was to build a rack more "flexible" than the existing models. Ernie reasoned that existing racks could only hold timetables of a certain maximum width- they were standardised, when the timetables themselves often were not. So he made the niches in his rack movable. He described it in the patent:

What I claim as new and desire to secure by Letters Patent is:

1. A display rack comprising a casing provided with shelves disposed stepwise, a horizontally disposed guide rod mounted above each shelf, and a plurality of vertically disposed partitions mounted for longitudinal shiftable movement upon each guide rod, each partition being equipped upon at least one of its faces with a laterally extended sleeve for frictionally engaging said guide rod.

2. A display rack comprising a casing provided with shelves disposed stepwise, a horizontally disposed guide rod mounted below each shelf, and a plurality of vertically disposed partitions mounted for longitudinal shiftable movement along each guide rod, each partition being equipped



upon at least one of its faces with a plate formed integral with which is a laterally extended sleeve for frictionally engaging 40 said guide rod.

***3.** A display rack comprising a casing provided with shelves disposed step-wise, which shelves at their bases are of channeled formation, a horizontal guide rod secured above each shelf and supported by the casing, and a plurality of longitudinally shiftable, vertically disposed, apertured partitions for each shelf, which partitions are provided with sleeves in alignment with so said apertures and which frictionally engage said guide rods, said partitions frictionally engaging the channeled portions of said shelves.*

4. A display rack comprising a casing provided with shelves disposed step-wise, a guide rod supported by the casing above each shelf and a plurality of longitudinally shiftable partitions for each shelf provided upon each face -with plates terminating in laterally extended sleeves for frictionally engaging a guide rod.

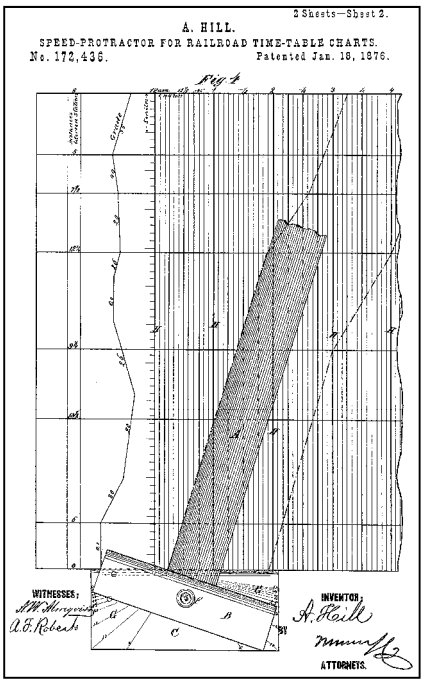
In testimony whereof, I have hereunto signed my name.

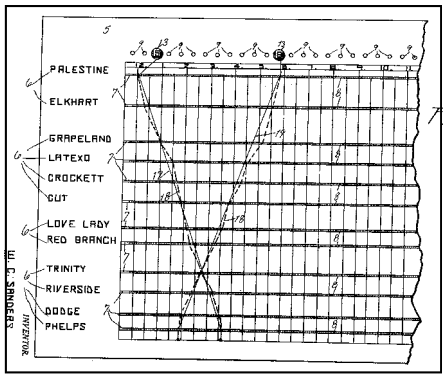
If you thought this tortured syntax to be just a sign of the times, you will be grieved to learn that all modern patents perpetuate it– this is "the way". But in case it wasn't clear, Ernie's patent included some drawings- they were almost mandatory. Most patents included a drawing or two. Ernie's drawing looked like that on the previous page:

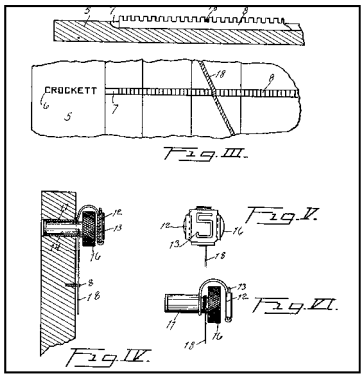
That seems like a good idea. They should have sold like hot-cakes. They didn't.

2. Stringing the Board.

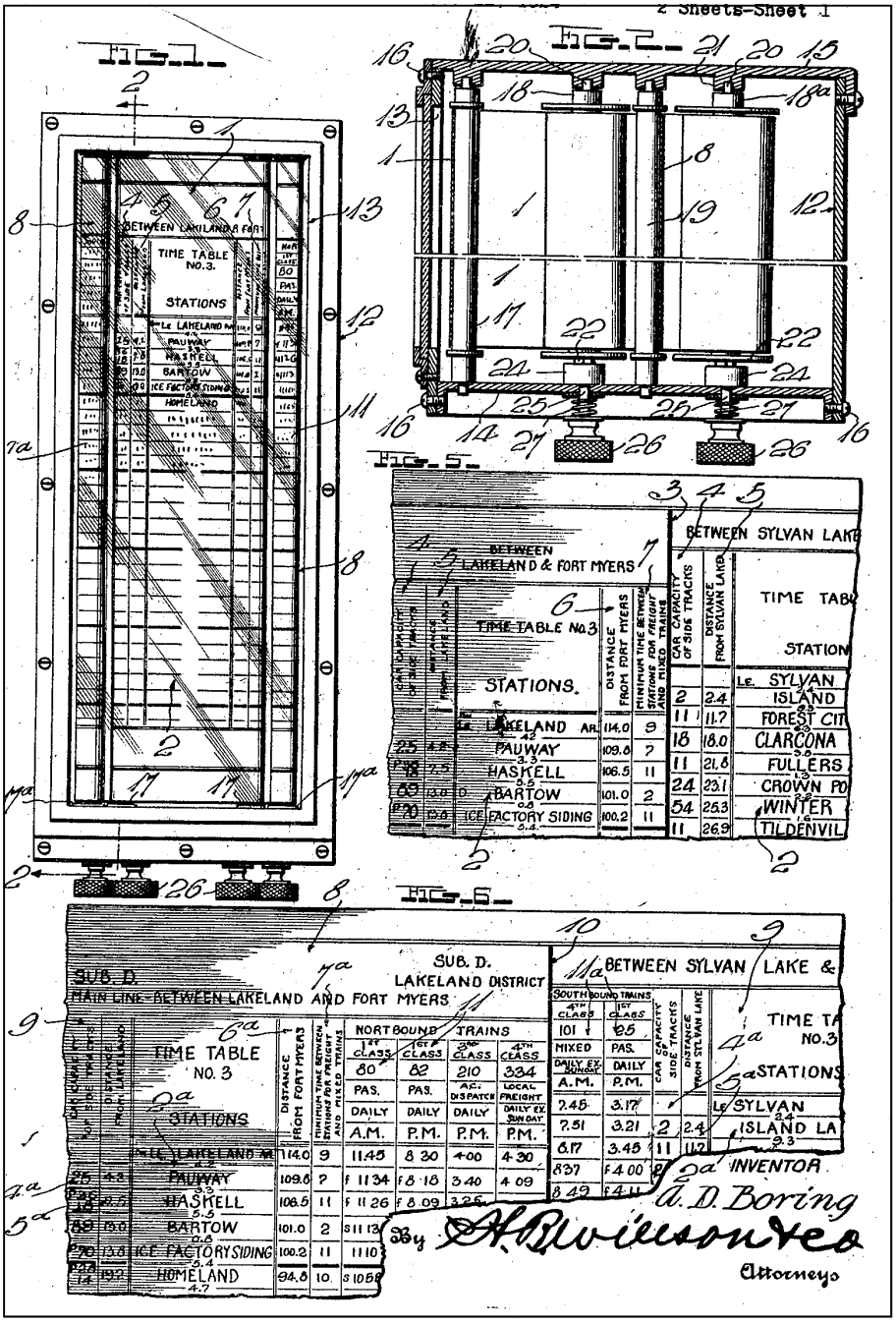
Two devices in the list relate to the production of graphical timetables. The first was described as an ***Improved Speed Protractor*** and was designed to allow draughtsmen to calculate the speed of trains between stations, or to use the known speed to draw the "string line" of the train. The drawing of it is shown below, left.







USPTO awarded this patent, but it was a bit of a cheat because such a device was part and parcel of the original invention of the graphical timetable more than three decades previously- The Times, **13**, #10, 7-



11 (1996).

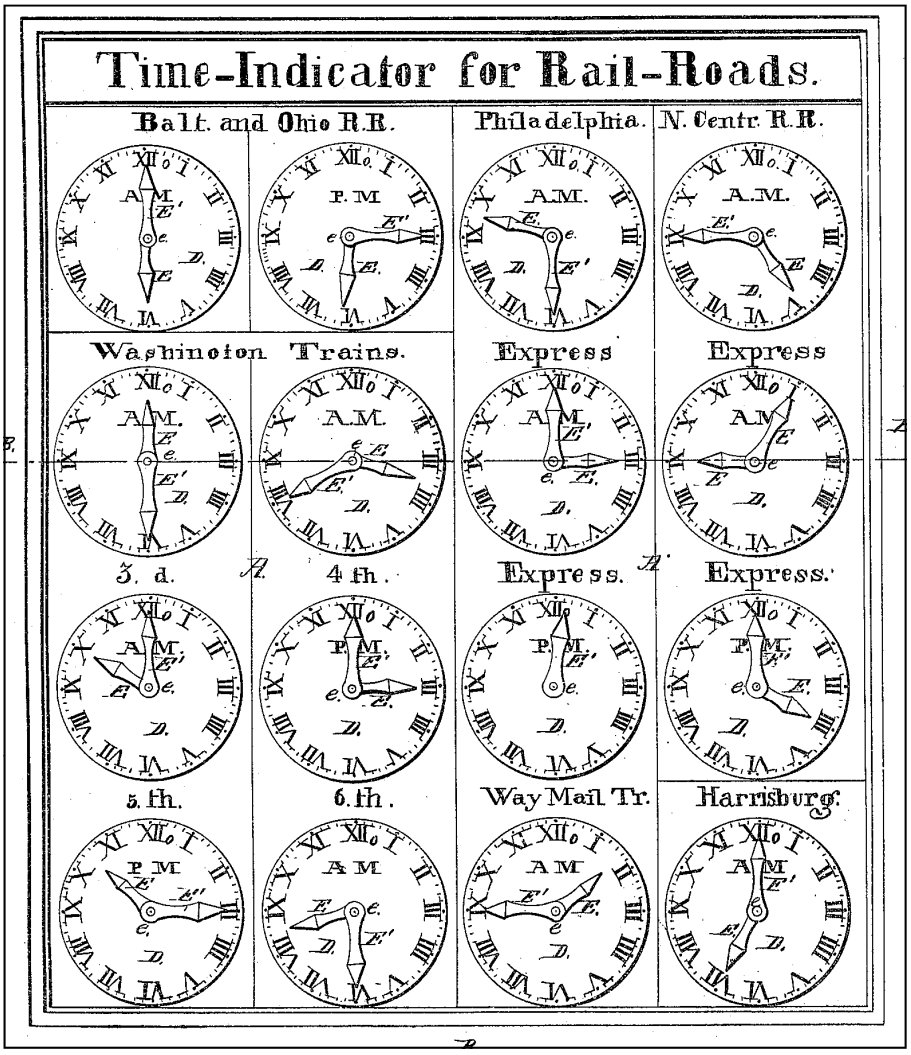
The second device was meant to eliminate the use of pins in drawing string line diagrams. This concept needs some explaining. I have tried to do so on page 15 by reprinting the article "Stringing the Board" from the November 1930 issue of the Southern Pacific Bulletin. A Queensland use of a string board was described in the ARHS Bulletin of **29**, 13-18 (1978). Suffice it to say that string diagrams consisted of a cork board to which a standard graphical timetable template could be fixed. Coloured threads representing trains were pinned to the template with thumb-tacks in the appropriate positions to represent trains. This was a more flexible method than hand-drawing the timetable.

Sanders said that the trouble with the pins was that they often fell out of the cork boards, especially in crowded and much-used areas. In his 1925 patent, the pins were replaced with movable "train plugs". These ran in horizontal slots; each slot represented a crossing station and was placed at a vertical location according to its location on the railroad track. The plugs were held to a particular horizontal position in the slot by projections which engaged in a row of teeth in each station slot. Each plug also rotated like a capstan and wound the train string up tight. Furthermore, the head of each plug was fitted with a non-rotating plate which could hold a label with the train number on it (above, right).

I rather suspect that Mr Sanders was probably an SP man who thought he saw a better way and patented his idea without reference to his employer. It didn't do him any good- the old string charts were still being wheeled out by SP thirty years later.

3. Player piano in the cab.

The locomotive engineer usually kept his timetable in a box under his seat. It was a difficult matter to refer to it in the unfavourable conditions of the locomotive cab. And it was a distraction- it usually seemed to be needed *just when the engineer ought to have his eagle eye on the track ahead*. So it said in Allen Boring's 1924 patent. His invention replaced the standard ETT book with a kind of piano roll, rather similar to the destination roll of a tram or bus. On the roll were printed the times of each train, laid out just as they would have been laid out on the paper timetable. The roll ran in a window which was surrounded by a replaceable plate containing the station information. The device was mounted at eye level in the cab. All the driver had to do was crank the handle until his train appeared in the slot—then away he went.



4. Train Departure Indicator

The above title looks simple enough. We see these things in airports and hotels all over the planet. What's the time in Tokyo right now? Easy! But this is something different and its inventor Mr Fitzpatrick of Kalamazoo reckoned it would be a boon to railroad and passenger alike. Each clock face represents the departure time of a particular train from the station concerned.

What, may you ask, does this device have that the NSWGR Central Station indicator board or an airport Solari Board not have? Nothing, really. Fitzpatrick was quick to admit this. He said that he would "limit his claims" to two: that his device showed every train of the day and that it contained a "cipher" to indicate whether any train was cancelled on the day in question. Can you spot it? The Patent Clerk thought he could, so he awarded the patent. Nobody took any notice.

5. Thumb Index timetable

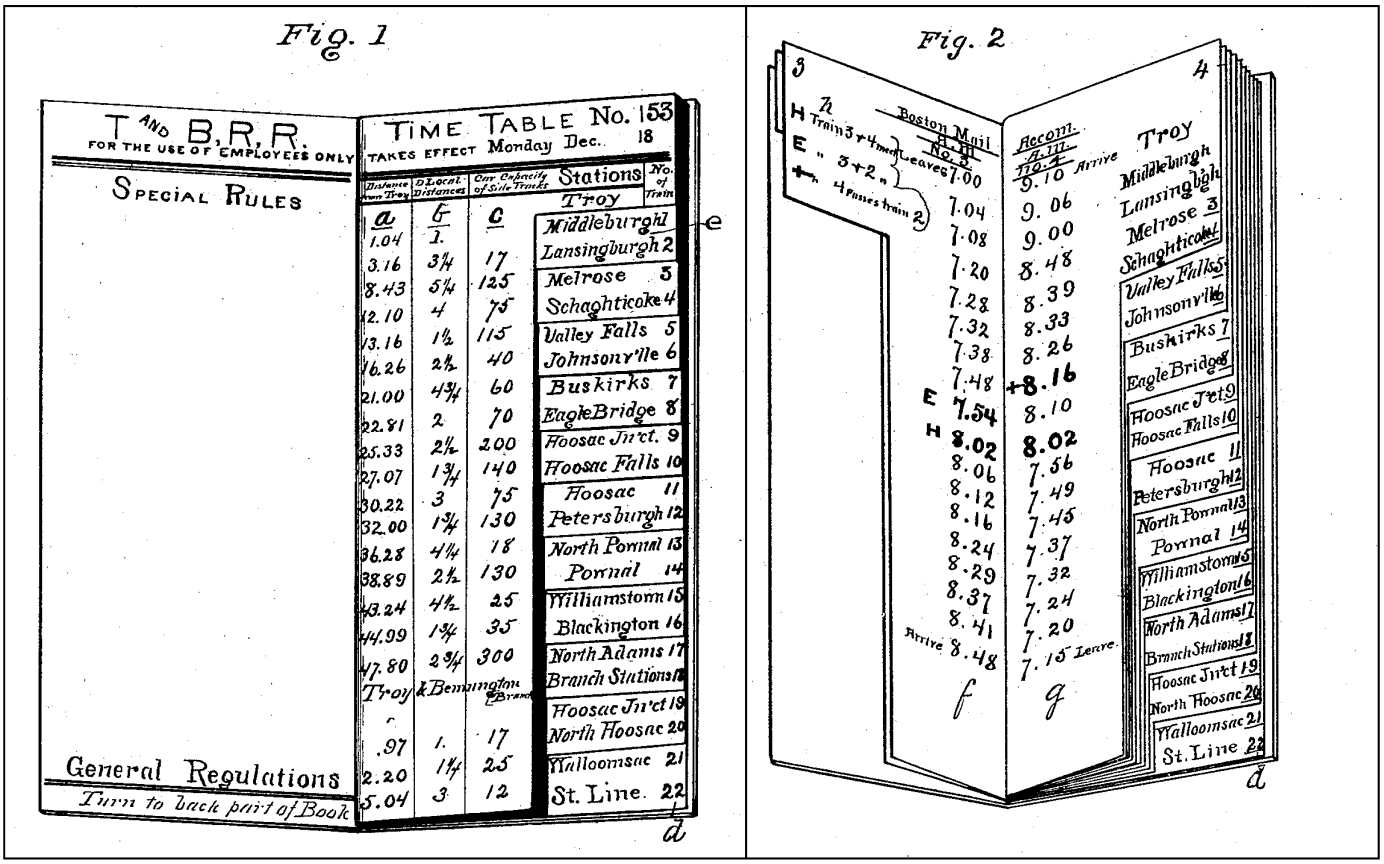
Making employee timetables easier to use seems to be a common theme in the USA. This one seems to have been designed around the standard bib-pocket timetable. It had the advantage that the engineer did not have to use his greasy thumb to flip over the pages (illustration top of p 12). I don't know about you, but I find the idea mystifying. After all, the index tabs did not contain any information about trains at all. How did the engineer use them to find what he wanted?

6. Perpetual Time Table

We all know about perpetual calendars- the type one finds in the back of ledger books still being produced. I use them every day in my laboratory. But what about a "perpetual timetable"? What would it look like? It looked like the object at the top of page 14.

If I were a safeworking nut-case (and I am), I would say it looked like an electric train staff with an Annet's Key to work an intermediate siding. But it isn't. Patent drawings, were usually redraughted by the USPTO staff to a standard form. They rarely showed scales or the size of the objects which they depicted. This one is about the size of a propelling pencil. Indeed, before its inventor John Covingtom got at it, it ***was*** a propelling pencil. In fact, in one version it could still be used as a pencil after it had become a timetable. It was designed to be carried in exactly the same way- in a shirt or vest pocket.

You might justifiably wonder where the station names came into it. They could



hardly be inscribed on the case of the pencil. But this was a kind of miniature "ABC" timetable. It listed only the departure times for a particular station. It operated like a mechanical odometer, with a number of rings engraved with hour and minutes, usually alternating between the two. These were spun on the central axis (literally the pencil lead in one version) to display the departure times. It is plain from the patentee's description that this was a devilishly tricky thing to adjust. Making it function properly was a delicate matter of machining the rings so that they could be moved by the thumb but were restrained by friction from spinning willy-nilly. The screw mechanism of the pencil was used to tighten them down once adjusted.

This little gadget was an 1892 brain-child of Mr John Covington, who lived in Brooklyn. It seems to me that his target audience was probably the Wall St stockbroker, who was increasingly moving out of lower Manhattan and commuting across the new Brooklyn Bridge. It is hard to say whether such a man was in the market for a handy pencil like this- but I very much doubt it. Although the USPTO awarded Covington Letters Patent fairly smartly, it is clear that it forced him to admit that his device was not especially novel. It had been used in much larger form for many years at the heads of platforms in stations and even in hotels.

7. Employee time card

Our last sample (page 14, bottom) looks just like any old Employee Time Table. This is exactly what it was—but with the advantage of allowing "Extras" to pose as "Regulars". At the time it was patented (1912) most employee timetables were full of trains—regular trains that is. I have a 1913 Pennsylvania ETT for the line through Altoona, which shows some 33 timetabled Westward trains per day over the Gallitzin summit. But it also shows, in a single compact table, 16 more trains described as "Preferred". For these, there was no timetable. They were the extras—mostly freight trains. On this four-track, signalled mainline, these trains could be slotted in any old how. Not so on a Western single-track line across the prairie. Non-extra trains on these lines ran according to timetable and train order- and the timetable took precedence. Extras ran according to train order only. The inventor of this new form of ETT, Edward Hardy, calculated that the average Train Dispatcher spent 3 to 4 hours of his 8-hour shift making up and telegraphing the train orders for 3 to 6 "Extras" each day. Each order required telegraphing over 100 words, separately sent to as many as 6 locations.

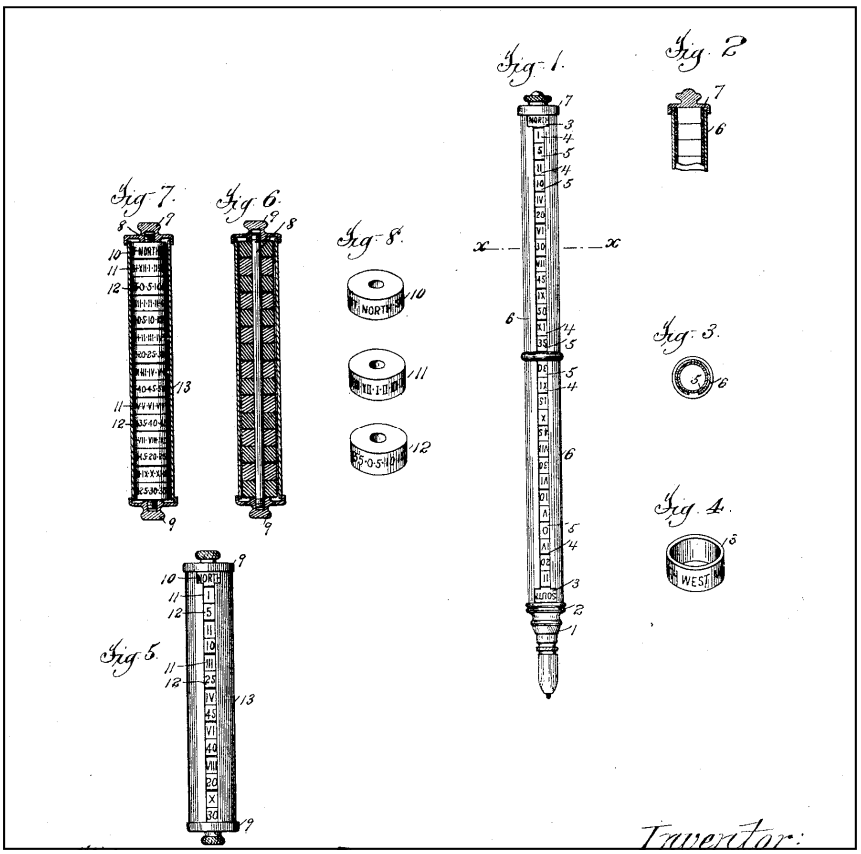
Hardy suggested that all of the potential Extras should be listed in the timetable under special "symbols". These schedules were to be printed in a different coloured ink or in a separate table. They were based on the maximum calculated running speed. This contrasted with the regular schedules, which were much more conservative and had "slack" time built in. When an extra was called for, the dispatcher broadcast a single brief order to invoke one of the "symbol schedules". When a train ran late, it could be rescheduled according to one of these accelerated "symbol schedules" and so catch up again. None of this disturbed the sanctity of the timetable system- Hardy saw this as the great advantage of his invention.

A Train Controller from an Australian railway would snort "Simple- he has merely inserted the 'Conditional' trains. We've been doing that for a century". This was true. But the important distinction for an American railroader was that Hardy's invention assigned to an Extra the rights normally only conferred to a timetabled train and reduced the work-load of a Dispatcher by a significant amount.

Like all the other inventions described in this article, this one seems to have been ignored totally. It has to be admitted though that US railroads did adopt the nomenclature of "Symbol Trains", though it is difficult to discern which was the chicken and which was the egg in this matter.

Conclusion

All of these inventions share the common attribute that they were good ideas but fundamentally useless. This is not so unusual for a patent in any field- the vast majority are quickly forgotten- or never even noticed.



WITNESSES

WEST BOUND. — SECOND DISTRICT — CLIFFS TO PASCO. — EAST BOUND.

THIRD CLASS		SECOND CLASS		FIRST CLASS			Car Capacity of Stations	Distance from Spokane	Time Table No. 20. In effect Nov. 14 1907. Stations.		Distance from Portland	Water, Coal, Wood, Turn Table, and Shops	FIRST CLASS			SECOND CLASS		THIRD CLASS
SYMBOL		SYMBOL		SYMBOL											SYMBOL			
E	Local Freight Mon. Wed. and Fri.	B	Time Freight Daily	A	Passenger Daily	Passenger Daily							Passenger Daily	Passenger Daily	C 2.02AM	Time Freight Daily	D	Local Freight Tues. Thur and Sat.
8.00 AM L	7.00 AM	11.30 AM L	10.45 AM	2.30 AM L	12.40 PM L	1.50 AM	Yard	1495	DN PASCO PA		2307	WCTA	A 4.05 PM	A 2.02 AM		A 2.40 PM	2.30 PM	A 6.15 PM
BETWEEN P. & S. JCT. & PASCO TRAINS WILL BE GOVERNED BY N. P. RY., PASCO DIV. TIME TABLE AND SPECIAL RULES.																		
8.06	7.08	11.35	10.53	2.35	12.44	1.55		1505	P.B.S. JUNCTION.		2297	J	4.01	1.57	1.55	2.32	2.20	6.07
8.08	7.10	11.37	10.55	2.36	S 12.45	f 1.56	85	1510	DN KENNEWICK KN		2292		$ 4.00	f 1.56	1.52	2.30	2.15	6.05
8.30	7.35	11.47	11.15	2.41	f 12.54	2.03	100	1561	FINLEY		2241		f 3.50	1.45	1.45	2.05	2.00	5.45
8.48	7.55	11.57	11.30	2.45	S 1.01	2.09	100	1603	D HOVER HO		2199		f 3.42	1.38	1.40	1.45	1.45	5.25
9.15	8.25	12.14 PM	11.50	2.52	f 1.10	2.18	100	1668	N YELLEPIT PY	B	2134	W	f 3.32	1.26	1.32	1.10	1.20	4.55
9.33	8.45	12.28	12.05 PM	2.57	f 1.18	2.25	100	1719	TOMAR		2083		f 3.23	F 1.17	1.25	12.45	1.00	4.15
9.55	9.10	12.42	12.25	3.02	f 1.27	2.33	100	1774	MOTTINGER GR		2028		f 3.13	1.07	1.18	12.25	12.45	3.35
10.25	9.30	12.53	12.40	3.07	f 1.35	2.39	100	1820	COLBIA		1982		f 3.05	12.58	1.13	12.01 PM	12.30	3.05
10.43	9.50	1.07	12.55	3.13	S 1.43	2.47	100	1873	D PLYMOUTH MO		1929	W	f 2.56	f 12.48	1.06	11.40	12.10 PM	2.20
11.00	10.10	1.17	1.07	3.18	f 1.49	2.52	100	1913	LONGVIEW		1889		f 2.50	12.42	1.01	F 11.20	11.55 AM	1.49
F 11.23	10.25	1.25	1.20	3.23	f 1.55	2.57	100	1950	COOLEDGE		1852		f 2.43	12.35	12.56	11.05	11.45	S 1.20
11.40	10.45	1.36	1.40	3.28	f 2.02	3.03	100	1997	PATTERSON		1805		f 2.35	12.27	12.51	10.45	11.30	1.00
11.55	11.05	1.47	1.55	3.32	f 2.08	3.09	100	2038	SAGE		1764		f 2.27	12.20	12.46 H	10.25	11.15	12.45
12.10	11.25	2.00	2.18	3.37	S 2.18	3.17	100	2095	DN WHITCOMB	Z	1707	W.C.	S 2.18	f 12.09 PM	12.40	10.00	10.55	12.20
12.35	11.50	2.16	2.45	3.42	f 2.30	3.26	100	2163	CARLEY		1639		f 2.06	11.57	12.32	9.30	10.35	11.50
		2.21				F	21	2180	ALDERDALE		1622		F		H		10.25	
12.55	12.20 PM	2.33	3.10	3.47	f 2.42	3.35	100	2223	M°CREDIE		1579		f 1.55	1.48	12.23	9.05	10.10	11.20
1.25	12.55	2.45	3.30	3.52	f 2.52	3.42	100	2276	MOONAX		1526	W	f 1.45	1.40	12.17	8.40	9.55	10.50
1.35	1.35	3.00	3.50	3.57	S 3.03	f 3.50	100	2335	D ROOSEVELT RO		1467		S 1.35	S 11.31	12.04 AM	8.15	9.35	10.20
1.55	2.00	3.15	4.10	4.03	f 3.13	3.58	100	2394	SUNDALE		1408		f 1.25	11.23	11.50 PM	7.50	9.15	9.50
2.18	2.25	3.27	4.30	4.09	f 3.23	4.05	100	2447	N FOUNTAIN FA		1355	W	f 1.15	11.13	11.52	7.25	9.00	9.25
2.35	2.45	3.40	4.50	4.18	f 3.33	4.12	100	2496	HARBIN		1306		f 1.06	11.05	11.46	7.00	8.45	9.00
2.50	3.05	3.55	5.05	4.23	f 3.42	4.18	100	2543	TOWAL		1259		f 12.58	10.58	11.40	6.40	8.25	8.35
3.20 PM	3.40	4.15 PM	5.30	4.29 AM	A 3.55 PM	A 4.29 AM	Yard	2613	DN CLIFFS	CF	1189	WCT	L 12.45 PM	L 10.47 PM	11.30 PM	L 6.10 AM	8.00 AM	L 8.00 AM
	203		75		1	3							2	4		76		204
	Mon. Wed. and Fri.		Daily		Daily	Daily	D						Daily	Daily		Daily		Tues. Thur and Sat.
7.20 AM 16.	8.40 12.9		6.45 16.6		3.15 34.5	2.39 42.3			Time Over District. Average Speed Per Hour				3.20 33.6	3.15 34.5		8.30 13.2		10.15 10.9

Stringing the Board

Mapping out of train schedules for timetable changes involves careful planning and use of an intricate system. **JOHN WILKINS** *reproduced this old article in a recent issue of First Edition, the news magazine of the NAOTC.*

Huddled together in one corner of a printing establishment in San Francisco, there stand forty-two frames about six by eight feet square, looking for all the world like a lot of black boards stored away in some school building during vacation time.

These boards belong to the Southern Pacific. They are known as timetable charts, and occupy an importance place in making up of the Company's timetables. There are three of these charts for each of the eleven railroad divisions, and others for branch lines.

Upon the face of each chart there has been placed certain data in permanent form. From left to right, the charts are divided by lines into twenty four sections which represent the twenty-four hours of the day, beginning and ending at midnight. Each of these sections is subdivided by lighter lines into twelve small parts, one representing every five minutes.

On each side of the charts, running from top to bottom, appear the names of the station on the section of the line represented. This, briefly, is the skeleton upon which new timetables are built, and the method of operation is interesting, extremely simple and, like all simple things, thoroughly efficient. There is practically no chance to make an error, which could easily occur were the timetables figured out on paper alone.

Whenever it is deemed desirable, for one reason or another, to make certain changes in the running times of trains, a call is sent out to interested officers on the line for a timetable meeting. The superintendents of the divisions affected, with their chief dispatchers, meet at the general office in San Francisco and a conference is held with officials of the operating and traffic departments.

It is necessary, we will say, to get one or two trains into Portland earlier than their existing schedule, in order to make proper connections with other lines. The changing of the schedules of the through trains may make necessary the readjustment of schedules of certain trains on branch lines, in order that they may make good connections with the through trains.

When it has finally been decided at what time the trains shall depart from San Francisco and arrive at Portland under the new schedule, the men go to the printing establishment, where the timetable charts are brought out of seclusion, their protective covers removed, a ball of red twine and paper and pins produced, and they are ready for action. This work of mapping out a train's movement visually on the chart is known as "stringing the board."

The first move is to place a pin in the chart in the space representing the station from which it will depart, and on the line showing hour and minute at which it will leave. To this pin is attached a piece of red twine, which is carried down to the point of destination, where it is attached to another pin placed in the proper space and line. Now, trains run faster at times; than they do at others. On a level stretch the speed is uniform, but in mountain work, where there are heavy grades or sharp curves to be negotiated, the speed is necessarily diminished. Officials of the division, being familiar with the operating conditions, then so adjust the string by means of pins that the proper amount of time to run between intermediate points is provided. This will at times give the string a very zig zag appearance on the chart, a short distance representing level country, then a waving line showing clearly that the going is slower.

The string representing trains running in one direction all run down the board from left to right — those in the opposite direction run up from right to left. It can therefore be told by a glance at the board in which direction any train is running. This automatically shows that, where two strings intersect, two trains meet each other - and the chart automatically shows at what point they will meet. If however, the meeting point is on single track where there is no passing track, then the trains must be shuffled about, with slight gain in time here or a slight loss there, until a meeting point is provided for at a point where the trains may pass without delay. This is done by mental estimate of the territory involved and the operating conditions, with constant readjustment of the pins holding the twine.

Once the main line trains are provided for, the work of lining up the schedules of branch line connections is gone into, operating with the same method; that is, beginning at the junction and working back to the other end of the branch.

When the work is completed, the chart shows clearly and positively the exact movement of all scheduled trains, and the points and exact time at which trains in opposing directions meet and pass each other. The work of preparing copy for the printer is then begun. One man sits at a desk with a copy of the current timetable before him and another man stands at the chart and calls off all the data recorded thereon. As he calls, the man at the desk checks closely against the timetable and makes such changes and corrections as are given him. When the printer's proof is submitted, instead of checking it against the copy submitted, it is checked against the chart.

The final proof OKd and the work of printing the new timetables started, the canvas covers which protect the charts, are buttoned on, and they are set aside until required again. The timetable which has just been worked out on the chart is allowed to remain on the boards, so that when the next job of readjustment comes up the work may be done with a minimum amount of time and labor.

This article appeared in the November 1930 issue of the Southern Pacific Bulletin, an employee publication. It was supplied by member Robert Johnson. This method of preparing a timetable was extensively used by others and was particularly useful in areas of high train density. It was also used by interurban railways and transit operators. The Chicago Transit Authority used it on its street car lines and later on its bus lines.

Today this process has been computerized. "Mental estimates" have been replaced by input data concerning allowable speeds, station dwell times, operating characteristics of the equipment (i.e. braking distances and acceleration rates), signal system constraints, track configuration and so forth. The output is still called a string chart and a timetable is directly produced without the need of someone calling out the information.

A Century of Central Station

Book Review by VICTOR ISAACS

A Century of Central: Sydney's Central Railway Station 1906 to 2006,

Robert McKillop. Donald Ellsmore and John Oakes, 160 pages, 138 illustrations, paperback, ISBN 978 0 0757870 6 9), published by Australian Railway Historical Society, NSW Division, (67 Renwick St Redfern NSW 2016), $38 ($7.50 postage/packaging).

This is a splendid book!

Although the book purports to trace the history of Sydney's Central station from its building and opening in 1906 for the next hundred years, in fact, it also traces the history of the two predecessor Sydney stations. As Central station is the keystone of the NSW system, it is in effect also a summary history of the NSW railways.

There are some extremely evocative pictures of the former Sydney stations as well as of Central. Looking at them, one can almost imagine travelling on a NSW train of long ago. There are a number of diagrams of Central station buildings and yard. The book is worth the purchase price for the illustrations alone.

The text takes us from the first railway in NSW in 1855, through the inadequacies of the Sydney's early stations, attempts to build a railway into the City, building of Central station, changes over the years, including the major changes engendered by the building of the City underground, and the momentous re-organisations of recent times. The book is worth the purchase price for the text alone.

There are useful appendices:

- A dateline of developments,
- Details of Central station floor use at various dates (circa 1906, 1926, 1946, 1976, 2006), and

Sydney station yard diagram in 1926.

There is nothing in the book of direct timetable interest. Nevertheless, the book is recommended for everyone with an interest in Australian Railway history.

The Traffic Trouble Office on the third floor at Central Station.

State Records Office of NSW [SRNSW Series 17420].