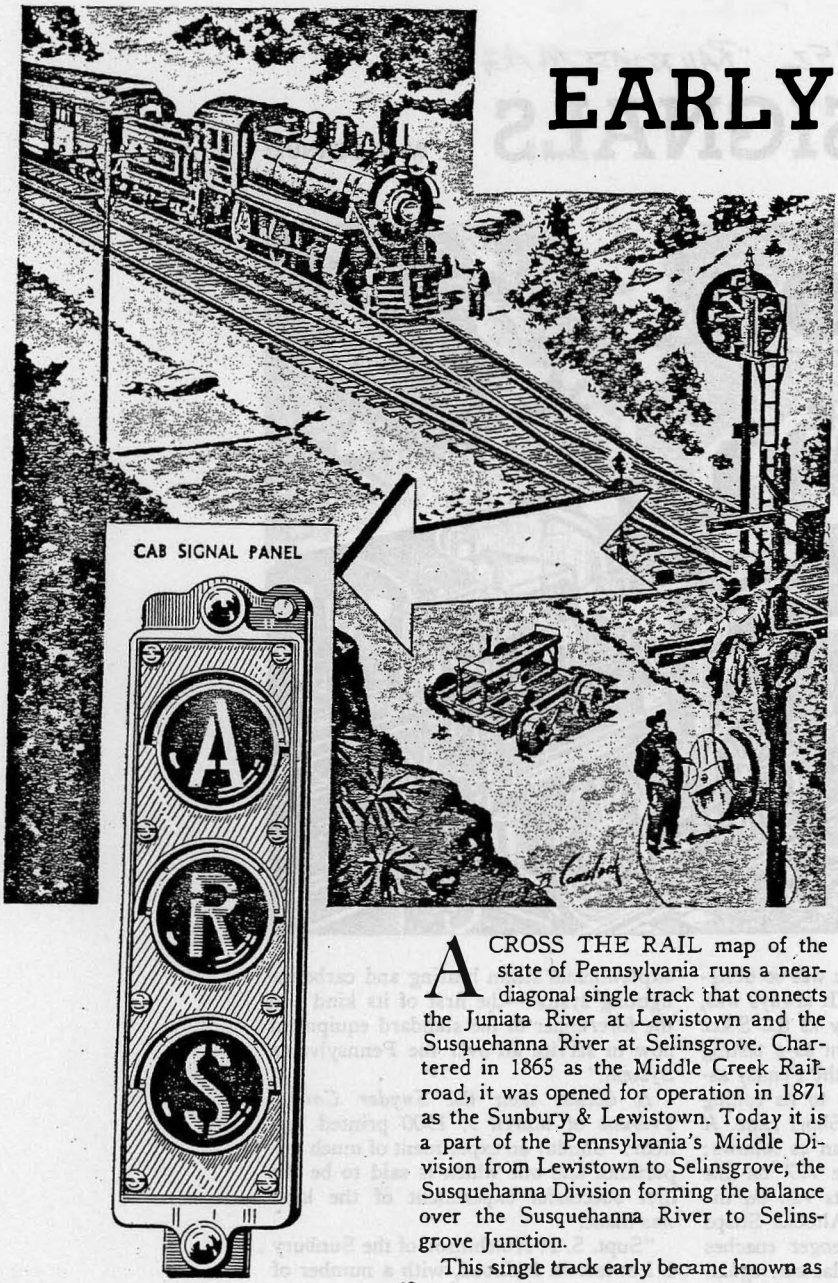
From "Railroad Magazine," Oct. 1952

EARLY



ACROSS THE RAIL map of the state of Pennsylvania runs a near-diagonal single track that connects the Juniata River at Lewistown and the Susquehanna River at Selinsgrove. Chartered in 1865 as the Middle Creek Railroad, it was opened for operation in 1871 as the Sunbury & Lewistown. Today it is a part of the Pennsylvania's Middle Division from Lewistown to Selinsgrove, the Susquehanna Division forming the balance over the Susquehanna River to Selinsgrove Junction.

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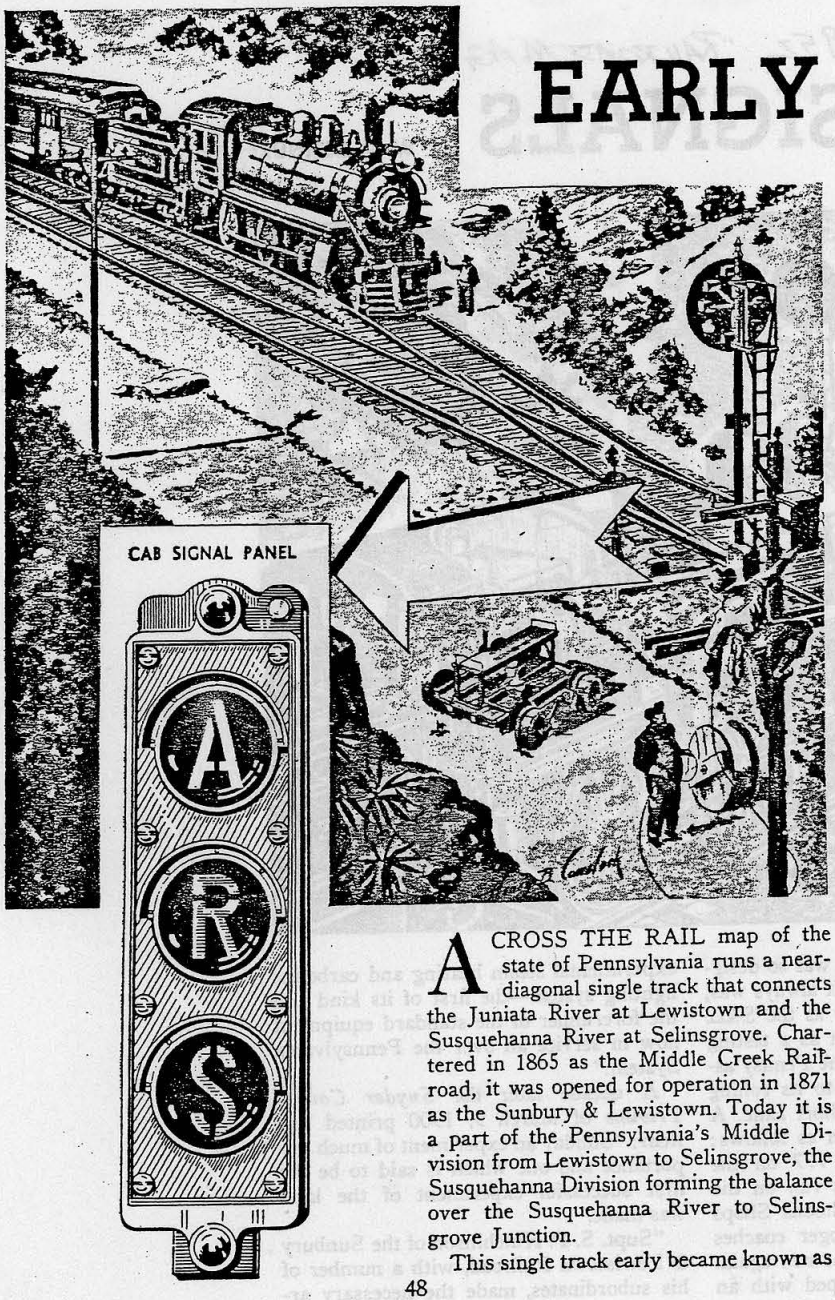

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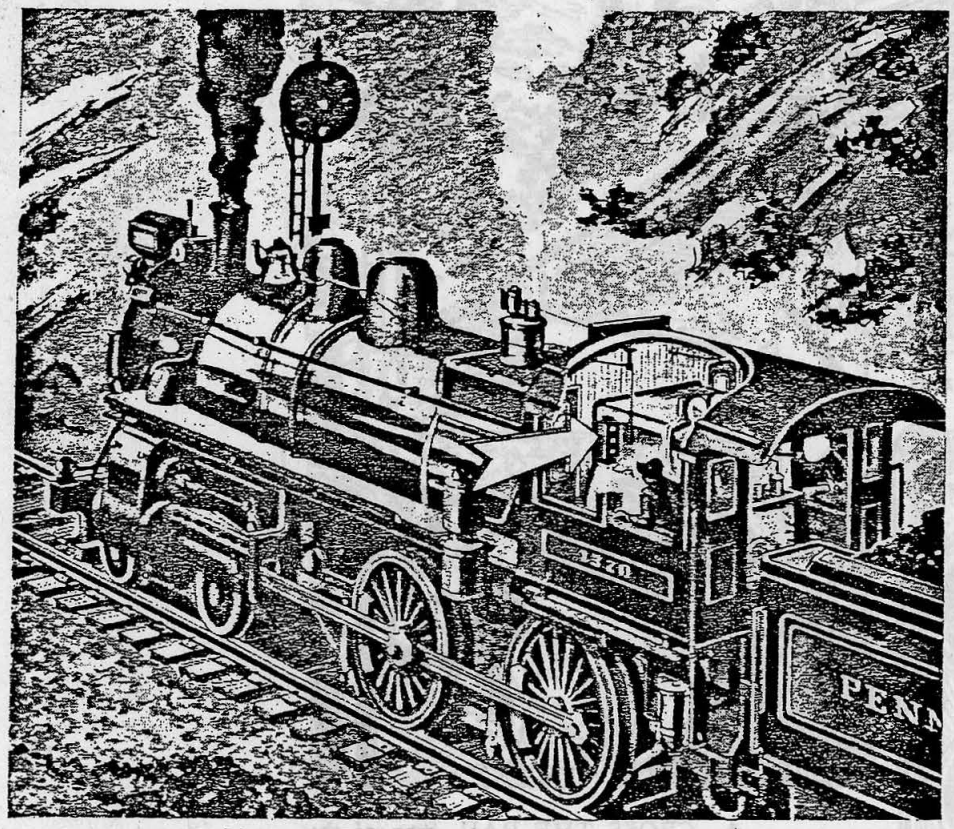
OCT. 1952 "RAILROAD MAG."

CAB SIGNALS

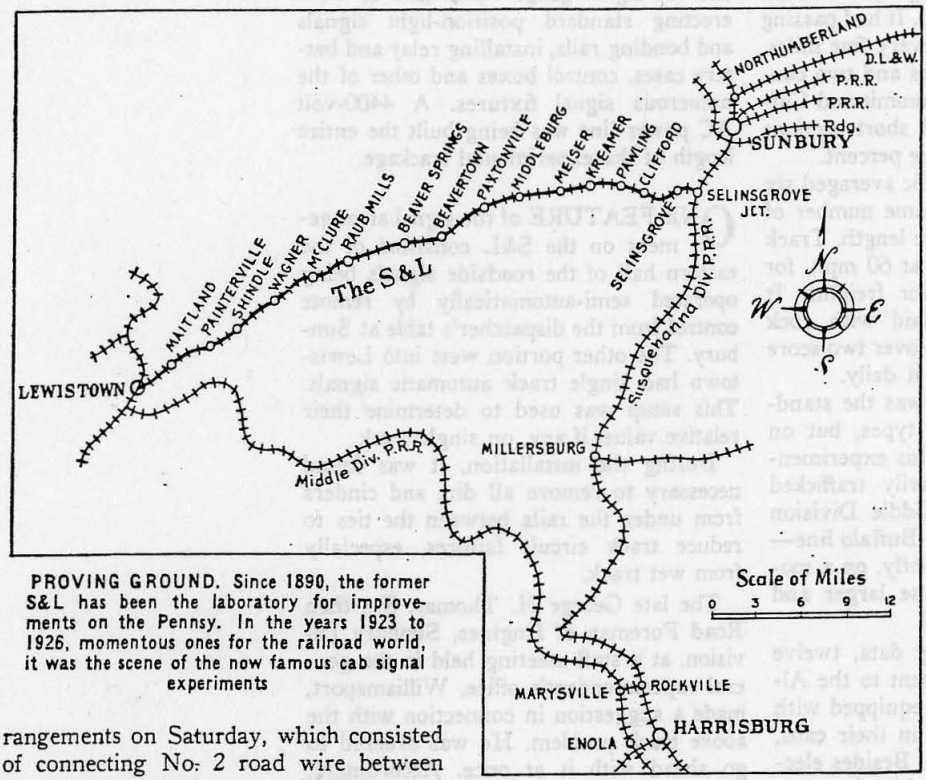
W. M. SCHNURE



the "Short Line" and traffic was so designated when routed over it. It always was, and is today, known locally as the S&L. It was early in the limelight as a testing road. In the Gay Nineties, the Pennsy assigned a new improvement to its rolling stock for a tryout on the Short Line. A contemporary news item ran as follows: "In January 1890, Engine 777 on the S&LRR was taken from its run on the *Mail* and fitted up at the Altoona Shops with especially fitted passenger coaches and then placed on its regular run again. This entire train was equipped with an experimental steam heating and carboline lighting system—the first of its kind and the forerunner of the standard equipment now in service all over the Pennsylvania System."

A decade later the *Snyder County Tribune* of March 9, 1900 printed this item: "Sunday an experiment of much importance and one which is said to be the first successful experiment of the kind was made.

"Supt. S. P. Hutchinson of the Sunbury & Lewistown Railroad, with a number of his subordinates, made the necessary ar-



PROVING GROUND. Since 1890, the former S&L has been the laboratory for improvements on the Pennsy. In the years 1923 to 1926, momentous ones for the railroad world, it was the scene of the now famous cab signal experiments

rangements on Saturday, which consisted of connecting No. 2 road wire between Lewistown and this place, with phone and telegraph instruments.

"The experiment consisted of sending a telegraph communication and a telephone message over the same wire at once and at the same time. The operator was able to send the message and simultaneously a telephone communication was transmitted to another person on the same wire. The experiment was a perfect success."

Recollections here place Trainmaster Charles F. Kissenger at Selinsgrove for the test—the office he had once worked as a telegraph operator on the S&L. An interesting development was the oddity of hearing over the train wire the air pumps and the bells on the yard engines outside of the then Lewistown (Junction) train dispatcher's office.

In 1923, an epic in railroading, on an experimental basis, again took place over this track between Chestnut Street, Lewistown, to Selinsgrove Junction when it was a portion of the now abolished Sunbury Division, with the late Lawrence W. Allibone as Superintendent.

As an adjunct to the single-track S&L, the double track of the Williamsport Division between Selinsgrove Junction and Race Street, Sunbury, was added so as to include certain other traffic.

From July 11th, 1923 to January 17th, 1926, the eyes of practically the entire railroad world were centered on this test, itself prompted by certain rulings of the Train Control Board of the Interstate Commerce Commission, then demanding additional safety protection on highspeed trunk lines.

The experiment involved the then newly developed "Union" Continuous Automatic Train Control, yet untried by traffic conditions. It was installed under the supervision of Chief Signal Engineer A. H. Rudd of the Pennsylvania Railroad, acting as chairman of its Train Control Board, in conjunction with the Union Switch &

Signal Co., inventor and manufacturer.

The cross-country, single-track S&L was an ideal testing ground. It had passing sidings on an average of every five miles, a minimum of sharp curves and two controlling grades—Ragers Summit and Clifford—both having several short sections with a grade of less than one percent.

This division's daily traffic averaged six passenger and about the same number of freight trains over its entire length. Track was 85-pound steel, rated at 60 mph. for first-class trains and 40 for freights. It had cinder ballast underlaid with rock ballast, from the days when over two score double-headed trains used it daily.

Assigned motive power was the standard Pennsy D16 and H6 types, but on account of the location of this experimental line between two heavily trafficked routes—the main line's Middle Division and that of the Washington-Buffalo line—detouring took place frequently, on a moment's notice, in which case larger and heavier power was handled.

According to contempory data, twelve or more locomotives were sent to the Altoona Shops to return later equipped with new, awe-inspiring devices in their cabs, on the frames and airbrakes. Besides electrical control features affected by the track circuit, two oblong upright metal boxes, with three illuminated circular glass apertures, were located in the cab in front of the engine crew. There was also a warning air whistle overhead in the cab; if the engineer did not acknowledge it within six seconds, the brakes went into emergency automatically.

No wonder these new gee-gaws were the subject of much discussion and inspection by interested motive power and signal experts, as well as engine crews from all parts of the country.

At the same time, switch shanty and caboose groups held hot-stove debates those cool days and nights of early '23, when the work of installing this new system was under way, as to just how this "superman" control would work under the slam and bang and twisting of a running locomotive.

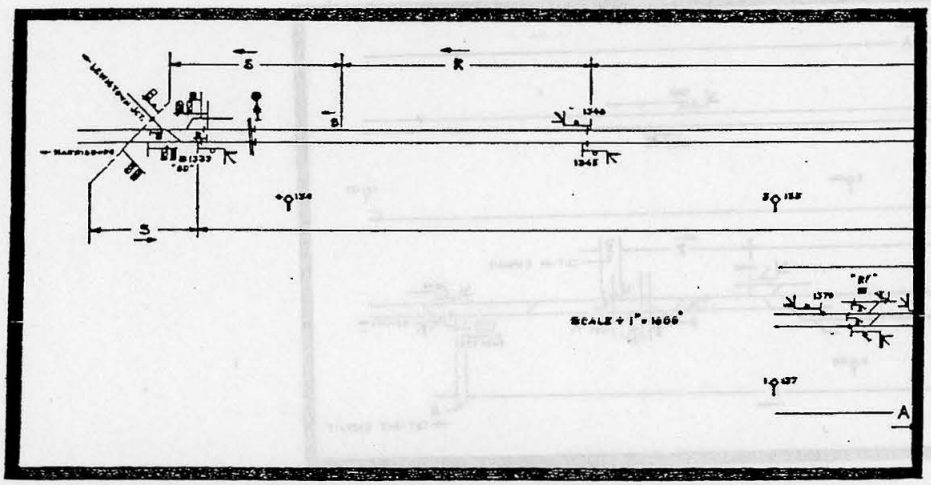
Construction Foreman Richard Jewens and his signal gangs were hard at work erecting standard position-light signals and bonding rails, installing relay and battery cases, control boxes and other of the numerous signal fixtures. A 4400-volt AC power line was being built the entire length of the experimental trackage.

ONE FEATURE of the signal arrangement on the S&L consisted of the eastern half of the roadside signals being operated semi-automatically by remote control from the dispatcher's table at Sunbury. The other portion west into Lewistown had single track automatic signals. This setup was used to determine their relative value, if any, on single track.

During the installation, it was found necessary to remove all dirt and cinders from under the rails between the ties to reduce track circuit failures, especially from wet track.

The late George H. Thomas, Sr., then Road Foreman of Engines, Sunbury Division, at a staff meeting held in the general superintendent's office, Williamsport, made a suggestion in connection with the above track problem. He was ordered to go ahead with it at once. Accordingly, Engine 2896, a D16b, was taken to the Northumberland Shops and equipped with a set of steam jets placed on both sides of the pilot, the nozzles being near and pointing towards the base of the rails on the inside of the track. The blowing steam successfully and economically cleaned the track ahead of the slowly moving locomotive.

A word about these cab signals that were the grandaddy of those now in use. Instead of the present illuminated position-light signal indications, repeating the outdoor signals, these had letters: "A" for "Authorized Speed" for two blocks ahead; "R" for "Medium Speed" one block ahead and "S" for "Slow" within 1800 feet ahead. These letters were used all through the experiment. The present arrangement of repeating the actual outdoor signals was suggested but not then acted on.



THE CRUCIBLE. Diagram of trackage and electrical circuits where pioneer tests actually took place in what was one of the first important instances of the practical application of electronics in *any* industry. Neat layout gives no evidence of bugs which developed during experiment. *Below:* Reproduction of pre-cab signal 19 order. Hoggers and conductors felt uneasy taking the main without flimsies, at first

Finally, after fourteen months of intensive activity on the part of signal, track and motive power experts, in close collaboration with the system's manufacturers, the installation was declared ready.

On July 11, 1923 at 12:01 a.m. Sunbury Division General Order No. 2309 went into effect when the manual-block stations at GD (Selinsgrove Junction), KF (Selinsgrove), K (Kreamer), FI (Middleburg), BV (Beavertown), MZ (McClure) and PB (Painterville), became train order offices only, with their semaphores normally in the proceed position. They were then stand-by points in case of any emergency that might arise in the operation of the train control experiment.

At the same time, all the facing-point distant switch signals were put out of service, relinquishing their function to the new cab signals.

Freight Conductor Hob Smith of Northumberland remarked: "It was very queer to accept a proceed signal and pull out on the main track without a running order in your hand, especially on single track. However, we got

19 PENNSYLVANIA RAILROAD SYSTEM 19

TRAIN ORDER No. 820

SUPERINTENDENT'S OFFICE "S" Dec 9 1927

To C&E Engs 3129-33+2706 At Selins Grove

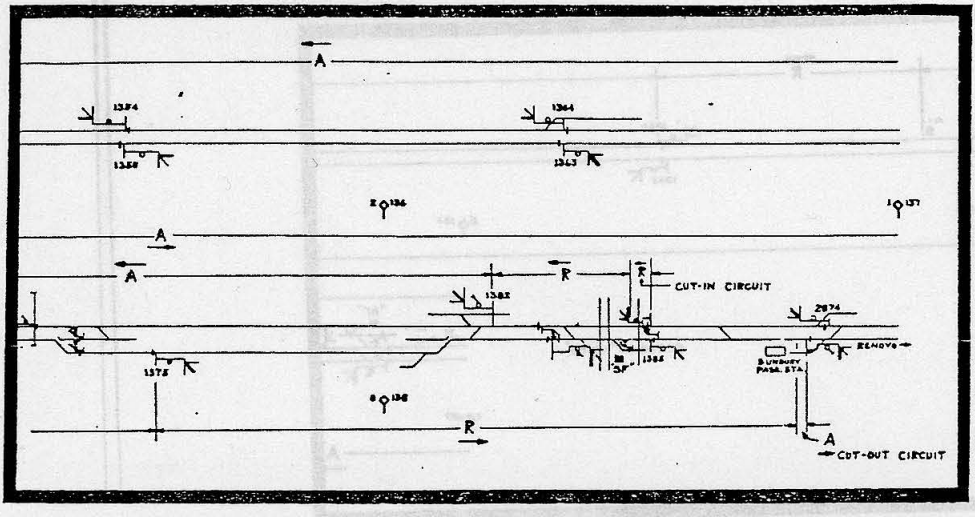
X Opr.: M

Engs 3129-33+2706 will run extra from Selins Grove to My Tower, must No 74 at Clifford 1st No 76 + 1st No 78 at Kreamer 2nd 3rd + 4th No 76 at Middleburg 5th + 6th No 76 at Beavertown 2nd No 78 at Beaver Springs and 3rd No 78 and extra 3121 east at Rogers Summit. No 74 - 1st 2nd 3rd 4th 5th + 6th No 76 - 1st + 2nd No 78 will take siding. Extra 3129-33+2706 west will take siding at Rogers Summit.

L. K. A.

EACH PERSON ADDRESSED MUST HAVE A COPY OF THIS ORDER

Made Complete Time 10.58 P.M. E. Boyer Operator



over that feeling and we ran on signals alone. When we came to a 'stop' signal that did not clear at once, we went to the nearby phone and called the dispatcher for orders, if any."

In addition to this protection against head and rear end collisions, the experiment included speed control. Also involved were several restricted curves, the sixteen-span Susquehanna River Bridge, and the borough of Selinsgrove with its five grade crossings and a 10 mph. ordinance.

In these restricted sections, the cab signals would indicate "S," and to emphasize the meaning, a governor on the pony truck brought prompt action if the designated speed was exceeded. That fact bore down considerably on some of the eagle-eyes who loved to get over the road when a bit late, regardless of rules.

The late Charlie Fisher, then living in Sunbury, was noted for his spurts of speed. He naturally resented any restrictions, and took chances at times on this new-fangled thing that held him down.

"Had a good run the other night," he would say, in pre-experiment days. "Brought a solid Pullman train down from Beavertown to Selins Grove in twenty minutes. Twenty miles, you know!" Then he'd smile.

During the experiment, the speed control caught him frequently, especially coming down off the Clifford grade into the Selinsgrove area, when he would hit the beginning of the circuit a little too fast. On would go the emergency. Then, red-faced, Fisher would get down from the cab as the conductor ran up, and reach under the fireman's side to turn an anglecock on the train line to reset his brake valve.

At the upper end of Sunbury, at Kase Tower, where the Wilkes-Barre route branches off, the operator reported Charlie for speeding through the interlocking. It seems that after cutting his engine off his train down at Sunbury passenger station, he would open up for about all it would do in his hurry to get into the Northumberland roundhouse.

So a few days later, the speeder was in front of Road Foreman of Engines Thomas to explain his spurts over the interlocking.

The conversation went something like this, according to the caboose talk: "Why Mr. Thomas," said Fisher with a surprised expression. "You know I have a speed regulator on my engine and I simply could not run that fast over the Kase switches!"

"So you have, Fisher. You are right. I don't see how you could have done it." Thomas nodded in approval. "O.K. I will take care of this complaint."

Then Fisher, with a wise look on his face, started down the stairs. However,

accompanying him was Thomas' assistant, who whispered to Charlie: "You know damn well you put one over on the boss. He didn't get it, but I know you were running without the control on your engine—you cut it out at Race Street. Now I want you to obey that speed limit over those switches or else . . . !"

WILLIAM J. McCOLLUM of Sunbury, retired engineer on the old Sunbury-Bellefonte passenger run, remarks:

"My wife and I went over to Mount Union to see her relatives one evening, boarding the S&L at Lewistown. I saw Bucky Mertz up on the front end. Before we left the station, in came Conductor Howard Stuck to tell me: 'Bucky wants you to come up in the cab with him to watch the cab signals.' I said. 'You tell Bucky I have enough riding in the cab every day to suit me!' At the next stop in came Stuck again. 'Bucky wants you to see them signals work.' So at McClure I went ahead and crawled up behind him. The cab signals worked perfectly but Bucky wasn't satisfied. Drifting into Selinsgrove, he let her strike the S circuit pretty fast and on went the emergency. He grinned at me knowingly and crawled down off the cab to release the valve.

"Bucky was some runner, too. I went over to Lewistown to a funeral of a lodge member before the days of the speed control. That day the S&L was busy detouring trains for the Middle Division. Before I left to come back, I dropped into the trainmaster's office to pay my respects and there was Bucky on the carpet.

" 'Bucky, you were running too fast today,' said the boss.

" 'Oh, I don't know.'

" '*I* know. I was sitting at the wire and got your time past every station and you were going too fast.'

" 'I don't know. I had a high-wheeled L-class, a hundred and eighty-five pounds of steam and didn't want to hold up things behind . . . but I pinched her down on the curves.'

" 'Bucky, you were still going too fast.' " That ended the interview.

Naturally, some bugs developed in the new experiment. For instance, through the Selinsgrove area the cab signals, instead of remaining at S would flick spasmodically to A, which caused some thinking on the part of the signal experts. They finally figured out it was due to stray AC current, so they commenced to comb the town for industries using power-driven machinery. A big feed mill, located just east of the depot where the trouble usually occurred, passed inspection, so the search continued.

Finally, far away down-town the railroad trouble-shooters found a badly grounded printing press. They also traced a water main crossing under the tracks near the feed mill. The problem was satisfactorily solved with orders going out for all electrical apparatus vital to the functioning of the cab signals and other parts, to be redesigned to operate on a non-commercial frequency.

Single track operation had its kinks at first. Hob Smith relates that his front brakeman opened the main track switch at the east end of Middleburg passing siding one day immediately after a westbound passenger train had passed. His train was eastbound. Hob was just on the phone getting permission from the dispatcher to occupy main track. Further up the line the passenger train was making an emergency stop as its cab signals went to S.

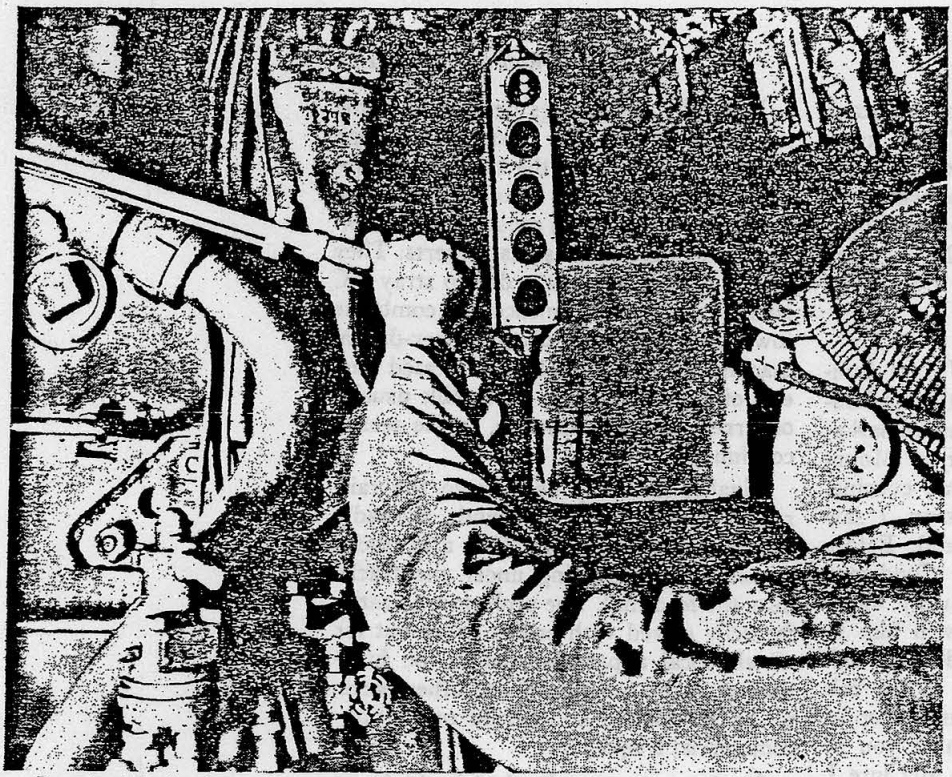
The freight crew yelled to Hob and the brakeman, who both knew what had happened, and the main track switch was immediately closed. That flicked the S back to A for the passenger, which proceeded after its brakes had been reset. This particular bug was rectified in its turn by changing certain circuit relays.

Hob Smith said he was shifting out a train in Lewistown yard one day when out came the yardmaster in a hurry.

"Can you pilot a mainline train down to Selins Grove Junction?" asked the official.

"Certainly. Call another conductor to take my place!"

"There were six trains to detour and there were only two S&L engines then



Pennsylvania Railroad

HOGGER'S CRYSTAL BALL tells him what conditions are ahead, even in pea soup fog. Enginemen soon learned to like traveling on signals, thought at first a fast runner might try to outsmart the system in order to make time

available with cab signals. Well, the train dispatcher gave us orders to run at reduced speed and be governed by signals alone. So we moved out, a block apart, the others closing in behind me at a Stop-and-Proceed signal. We had no trouble."

Signal Foreman Jewens, who had charge of the installation after it was in service, related: "One night the operator at the Junction (Lewistown) called me on the phone. 'Jewens, come right over here. We have a flock of trains to detour.' I asked him if he had enough S&L engines with cab signals. 'Yes,' he answered. All right, put one in front of each train detouring and let them go. You don't need me! And I rolled over in bed and went to sleep. I knew there would be no trouble and there wasn't."

Today two old veterans of the experiment period help S70 and S71 peddle over the S&L out of Northumberland—out one day and back the next—Conductor Carl (Bunny) W. Haas and Engineer Ed Price. Back in the '20s, Bunny was flagman and extra conductor on the passenger board, usually with Conductor Joe Downs out of Sunbury. Price was then baling black diamonds into the H6 firedoors.

Bunny Haas remembers a special he had one day out of Sunbury. It had Superintendent Allibone on board.

"At Paxtonville we received orders to run wide open against another special out of Lewistown. L.W.A.—that was the boss—who was always excitable, was a bit skittish about that order and went up front to the engineer and said to him, sort of under his breath: 'Take it a little easy!'"

"Notwithstanding, the front end opened

her up and we went hunting for the eastbound special. Well, Allibone was very much excited but we had our written orders and that was that. Anyhow, when we hit Painterville, things began to click. Our cab signals jumped from A to R and then to S. We slowed down to 15 miles per hour and soon we saw the other extra coming towards us—and it was also going 15 miles per hour."

Bunny had a good laugh telling that story. Pressed for some more recollections of those exciting incidents, he smiled and took another twist of tobacco.

"I was flagging for Joe Downs one night on 8854, with Eddie Matthews ahead. We had a scheduled meet with 8855 at McClure, but you know we had really thrown away the schedule and Book of Rules, so to speak, when the test started. Anyhow, pulling in at the west end of McClure, I shut the switch and we ran on down to the station. The passing siding those days was about half a mile long. After we had unloaded and loaded passengers and taken care of the front end business, Joe signaled Eddie to pull ahead to clear the street crossing alongside the station. Then Joe and I walked back to the station right at the rear of the train and started to talk to Agent Rauch. Suddenly the telephone was ringing and the dispatcher was saying: 'Riddle on 8855 is at the east end of Raubs Mills on the phone asking why they have to run with an S signal. He is losing time. Are you fellows in the clear?'

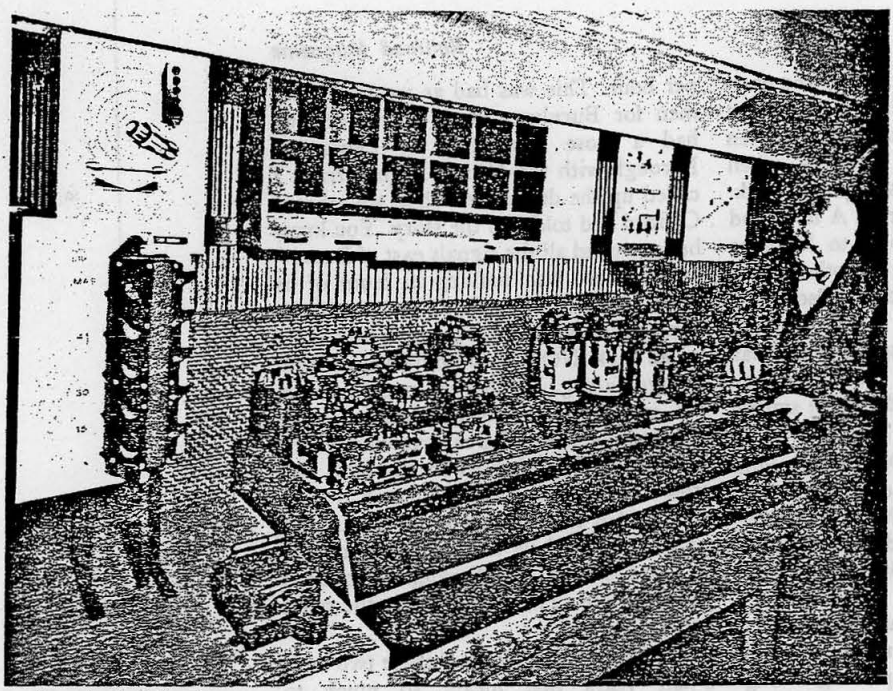
"JOE LOOKED at me and said: 'Bunny, run down and see if Ed is out too far.' So down I ran and yelled at Eddie to look if he was out beyond the clearance circuit. 'Jiminy Christmas,' yelled Eddie, and out of the cab he went. He found his engine was out too far. In a second, he was backing our train and in a few minutes 8855 went by at full speed."

"Oh, I could go on and tell of dozens of such things. One morning I was conductor on No. 8749 out of Sunbury at 4:10 a.m. Leaving Selinsgrove we picked up an S indication and slowed down to 15 miles per hour. This was bad as we had workmen for Burnham Steel Works and we had a close connection in Lewistown Borough with the Milroy Branch train. I called up the dispatcher when we reached Clifford and told him the story. You know he controlled all the signals east of Beavertown. There was nothing in front of us when I said to him: 'Look and see if you don't have a button out on your desk!' He yelled back 'NO!' So we pulled ahead and dragged along. I called up again and got the same answer, so we dragged some more till we reached Beavertown with the S signal still staring us in the face. But from there on, we had no more trouble and started to make up some of our lost time. Several days later I heard on the q.t. that one of the dispatcher's buttons *had* been out. That was one on the office end."

We kept talking along of these two-and-a-half years that meant so much to present-day railroading and Bunny recalled a run that was especially printed on his memory.

"I was conductor on 8854 one night and leaving Middleburg the cab indication went to R. Passing Kreamer, 5 miles further, the R changed to S. We were then going up Clifford hill and one of the passengers started to fuss and fume and even to swear at the slowness of the train. You know, you have to be careful with the public and I remarked to him that we were traveling on the safest piece of railroad in the world, which of course, got quite a rise out of him. But he kept on with his sarcastic remarks and still fussed about the slow train and so on. When we reached Selinsgrove, I went into the office and reported the S speed we had been running under. There they told me the reason.

"After the train had started, I went back to the disgruntled passenger and said: 'Brother, I told you before that we are governed by electrical apparatus on this track. It might interest you to know that if we had been running at our regular speed, you and I might not be alive now. We ran over a broken rail up on the hill.'



Pennsylvania Railroad

WORKING MODEL shows how cab signal system operates. Three horizontal lights with a single light below (just in front of demonstrator's right hand) indicate "stop and proceed not faster than 15 mph. prepared to stop short of another train." Three diagonal lights indicate "approach", with a 30-mile speed limit. Three vertical lights indicate "clear". To the left of model layout is actual cab signal indicator; at lower left is engineer's acknowledging switch

I didn't hear any more wise cracks from that passenger."

In other words, soon after the test began, general satisfaction prevailed and the trains moved back and forth with little delay. Trainmen soon liked running on signals instead of stopping for orders to meet or pass another train or to run ahead of a delayed train. They had confidence in the system's practically fool-proof construction and operation.

The fact that fog, rain, snow or sleet made no difference in the perfect operation of the system was paramount, the fog factor being especially important in the river areas at both ends of the S&L. In fact, trains could keep their schedules even when the visibility was limited to the smoke-stack.

So when the curtain was rung down in 1926, the experiment was considered money well spent. It was the forerunner of similar installations on hundreds of miles of highspeed track in all parts of the country.

Broken rails, damaged and broken electrical and mechanical parts, cars, and even trains improperly cleared on side tracks and other dangerous conditions were picked up by the cab signal system, and all these things went a long way towards proving its worth.

What about the S&L today?

You cannot find a trace of this wonderful experiment, except an occasional bond wire along its tracks. To all appearances it is just another piece of railroad.

Its honorable past gone, it is today, in spite of its strategic position in the rail picture of the Keystone State, seemingly maintained and operated like a third grade freight line.