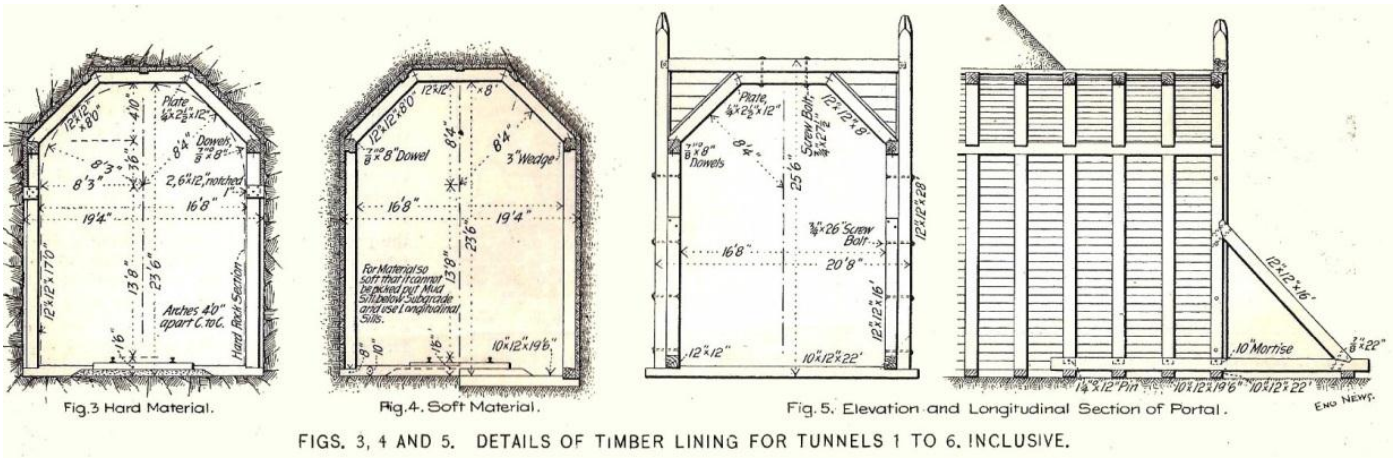
Blasting, Landslides, and Tunnels on the E&MC Ry.

By October 1892, the E&MC Ry reached Granite Falls (giving rise to our now-famous Railroad Days celebration in October of each year). As you might suspect, the really difficult work was yet to come. Chief Engineer R. B. Fisher wrote about it an article appearing in the Oct 5, 1893 Engineering News:

"The most interesting part of the construction was in the canyon. The lower two miles gave very little trouble, as the material stood fairly well, excepting for a few hundred feet through clay, which was as usual annoying and expensive. The middle section of the canyon is comprise of a peculiar rock. When blasted it breaks up in very small fragments, nine-tenths of it too small for riprap. The seams are of clay and a soft white material like quartz in color. The outward parts of the rocks are usually decomposed for a few feet. When the lower portions of the slopes were removed great landslides developed. These slides came down sometimes with little warning, sometimes with none, but generally gave notice by the crumbling and rolling down of small fragments from the slopes. There were over 50 of the in the canyon varying from 4 cu. Yds. To over 15,000 cu yds. In volume. The material in these was much pulverized in coming down."



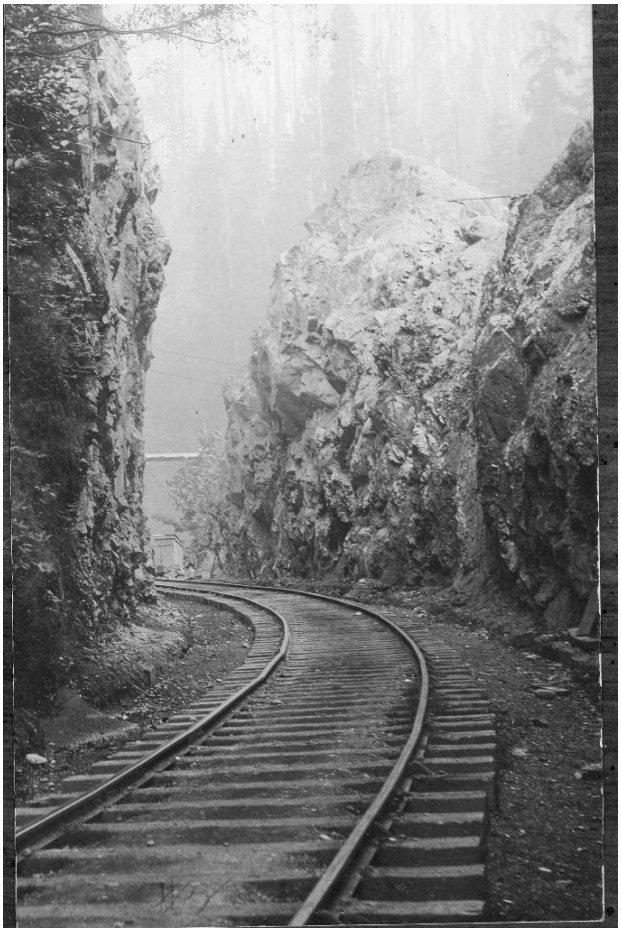
FIGS. 3, 4 AND 5. DETAILS OF TIMBER LINING FOR TUNNELS 1 TO 6. INCLUSIVE.

For those readers who have hiked Old Robe Trail, you can appreciate much of his description, for you've seen the area around Tunnel #5 and Tunnel #6. For those of you lucky enough to have visited Tunnel #1, you can truly appreciate the magnitude of their task. If you've never hiked in Robe Canyon, you owe it to yourself to take a short drive and get it done! The trail head is near the top of Sand Hill, just six miles from Granite Falls on the Mountain Loop Highway. It's a short hike, not terribly strenuous, but very scenic and very historic. You'll encounter artifacts from the huge Johnson-Dean mill that once stood at the east end of the original townsite of Robe, WA. With care, you can hike through Tunnel 6 then Tunnel 5, if slides have not blocked the trail.

Picture at left shows the east portal of Tunnel #1, the longest on the line. You can still access that portal today (2014), although the far end is caved in.

"There are six tunnels in the canyon, all through projecting spurs *[rock outcroppings]*. No especial difficulties were met in driving these with the exception of tunnel No. 2. The principal dimensions of each and progress of work are shown in the following table:

No. of tunnel	Length ft,	Work begun, 1892	Tunnel finished 1892	Time, days	Avg Progress Per day, ft.	No. M ft. B.M. in lining
1	817	May 7	Nov 9	186	4.39	276.8
2	138	July 18	Nov 12	117	1.18	87.4
3	250	June 10	Oct 20	132	1.97	109.0
4	149	July 11	Nov 6	118	1.26	77.8
5	81	Aug 22	Nov 3	73	1.11	42.0
6	278	June 30	Oct 8	100	2.76	60.8



The top of Tunnel #2 was blown off while the rails were still in use. This shows the "cut" looking eastward. You can see a suspension bridge crossing the tracks at the east end of the tunnel in the old picture.

"All the tunnels are timbered with the exception of the middle portion of Nos. 1 and 6. The character of the timbering for the different materials penetrated is shown in Fig. 3, 4, and 5. For the sections in earth the excavation was 16 cu. yds. per lin. ft., and for the rock section 13 ¼ cu. yds. per lin. ft. A small air compressor was used in the east end of Tunnel No. 1, running two Ingersoll-Sergeant drills; but all the other tunnels were driven by hand."

"Tunnel No. 2 with which some trouble was experienced, as noted above, is on a 12^{o} curve. It was at first thought to be a very favorable place for a tunnel, with hard rock and overlying sand. It was desired to work this tunnel from the west, principally on account of the disposition of the material, but when ready to face up for going under, the rock commenced dipping, leaving the heading partly in rock and partly in sane. Meanwhile the cut was carried further into the spur, and work was carried on from the east until

the middle of September, when the eastern heading strucksand, which poured into the tunnel and could not be stopped. It now appeared that the line of the tunnel ran into an old crevice, which had since filled with sand and water-worn material, and it was determined to take the remaining distance, 107 ft, out as an open cut. A very large portion of this was taken out from the heading of the tunnel at the east end. This open cut was not completed until February 1893.

You can still hike to Tunnel #5. These pictures show the “then” and “now” of the west end of Tunnel #5.

Next: Cave-in!