improvements in this, and many other respects, were inaugurated, and the tracks were laid to a grade of from 7″ to 10″ per 100′. Track-laying is a very important matter in the economy of a mine, and a good track will always pay for itself many times over. The tracks should not only be good, but there should be plenty of them, and placed so that they will be close to the rock to be removed. In drifts moveable lengths of 8′ or 10′ should be used. This saves shovelling to a long distance by placing them in position as soon as there is room, and enables the mucker to work to advantage, until there is sufficient space for the ordinary 16′ or 20′ rails. The rails are laid on 4″ x 6″ ties, 3′ in length, and placed about 4′ apart, the rails weighing 16 and 20 lbs. to the yard. The waste rock encountered in development was trammed to the shaft and sent to the surface, though now most of it is filled into the stopes of the upper levels.

When the miners began to stope on any level, an upright post was rigged, and the holes pointed upward and backward. On a narrow part of the vein a cross-bar was often employed, which enabled the muckers to tram beneath from another part of the level, while drilling operations were being prosecuted. Whenever convenient, however, the miners prefer to rig upright, as they can drill more advantageously from that position. As they climbed higher on the vein, hitches were cut in the foot-wall, and stulls were put in from foot to hanging walls. One end was fitted into the hitch, and the other end cut with such a bevel that it fitted against the hanging wall, which had been previously faced if necessary. (See Fig. 1.) The greater weight coming on the stull, the more securely it would remain in place. These stulls were placed tightly in position, and wedged if necessary or possible. If there was any liability of their being knocked out by blasting, a hitch was also cut in the hanging wall. Stulls were used to form floors to work from at intervals of nearly 20′, and such a distance apart horizontally, that the lagging placed upon them would not be broken by the blasts above. They were also put up against any bad ground that required them. The lagging used on the stulls consisted of round poles, and plank chutes were run up the stope at convenient intervals.

An idea of the stope and chutes may be gathered from Figs. 2 and 3. A cross-bar and stage is shown in Fig. 2, but usually most of the work is done from the broken ore resting on the stulls, and an upright post is rigged, either on this ore or on benches on the footwall.

But where the ore body widened stulls could not be used. Here the stope was started by enlarging the drift to the total width of the deposit, and a face obtained right across the vein. In one case the width varied from 40′ to 80′, and, as a back or roof of this size would be dangerous to work under without some support, the timber had to be quite close to the face. When the muck was removed mudsills