

AN IMPROVED RAILROAD SIGNAL.

A signal designed to give a positive alarm to the engineer on the locomotive when his train approaches an en switch or drawbridge, or a semaphore set at danger," has been patented by Mr. James S. Parmenter, of Woodstock, Ontario, Canada, and is shown in the accompanying illustration. From the top of

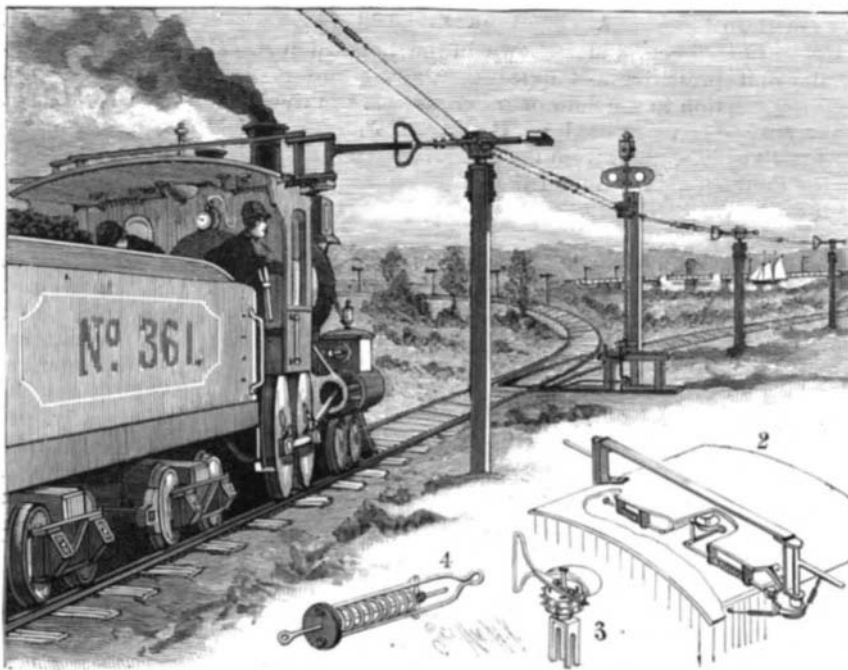
erected along the track, at convenient distances apart on each side of the ordinary danger signal, wings or arms are made to project toward the line when there is danger ahead, and operate a swinging bracket on the locomotive, by which a bell is rung inside the cab, the wings being held parallel with the line when the road is clear. Each wing forms part of a slotted extension bar adjustably secured to the top of a double sprocket wheel journaled in a forked bracket adjustably attached to the top of the post, as shown in Fig. 3, a sheet iron cover protecting their parts from snow, ice, etc. On the main shaft of the switch, near the top, a similar sprocket wheel is mounted upon it and connected with the others in the series by a wire rope or cable. At the lower end of the switch shaft is a gear wheel meshing with a gear pinion on the countershaft connected with the switch bar, which is operated by a handle. That the wire connecting rope may be held taut at all times, without being affected by changes in the temperature, an automatic take-up turn buckle is provided, as shown in Fig. 4, by which compensation is made for expansion and contraction. Swing brackets journaled at the top of the cab on each side have extension pieces normally extending outward at right angles, and held in such position by spiral springs connected with a corrugated eccentric plate, as shown in Fig. 2. Sliding rods held in brackets on the interior top of the cab have their outer ends held against the corrugated edges of the eccentric plate by springs, and hinged to each rod is a hammer lever adapted to strike an alarm upon a bell. The extension wings being positively held toward the track, at about right angles, whenever a switch or drawbridge is open, or a semaphore at "danger," the extension piece of the swinging bracket on the approaching locomotive in such case strikes the wings and causes the alarm to be sounded in the cab, the bracket swinging backward sufficiently to allow it to pass the wing. In using this device upon a curve, it is designed to have a shaft on each post, extending downward to within three feet from the ground, made triangular in cross section at its lower end, wrenches to fit this shape being then carried upon the train, so that when a train might be delayed at or near a curve, the signal might be set by a train hand from the nearest post, without the necessity of going back a half mile or so to signal, in the ordinary way, a train that may be following.

TERRACING IN THE FOOTHILLS.

There is a strip of country on the east and north of the San Joaquin and Sacramento valleys that extends their entire length, known as the "thermal belt." It lies in the first foothill lands that rise out of the valleys, and is only a few miles in width. There is less frost here than in the valleys; and above, the cold steadily increases until the summit of the Sierras is reached. In this region a great variety of fruit can be grown of superior quality.

Many of the hillsides, however, are too steep to be planted to orchards in the ordinary manner, but during the last few years some of them have been terraced and planted to oranges and early peaches with results that are highly satisfactory. Both the fruits require abundant water, but the land on which the trees are grown must have perfect drainage. They will then produce fruit large in size, and in great quantity, and it will ripen earlier than where less water can be used, as I have noticed for some years the finest fruit and the first to ripen was always from trees

that stood near water ditches on hillsides. The ground thrown over in terracing gives depth of loosened soil that makes a rapid and healthy growth of tree and fruit, that it is thought fully compensates for the cost of the work. The terracing gives picturesque beauty to the country, of the highest order known to practical horticulture, thereby creating a value beyond intrinsic

**PARMENTER'S RAILROAD SIGNAL.**

comparison. Newcastle, with an altitude of 1,356 ft., is in a direct line six miles northeast from Rocklin—altitude 249 ft., Loomis and Penryn being between the two places, and all on the line of the Central Pacific Railroad, the land rising at the rate of over 100 ft. to the mile. Sacramento can be seen from each of these towns, and is distant from Rocklin twenty-two miles.

A ridge of land beginning at Newcastle runs west some two or three miles, when it curves toward the south for several miles, abruptly terminating west of Rocklin, and very near the town. A large portion of the land lying north and west of Rocklin, Loomis, and Penryn, between the top of the ridge and the railroad, belongs to the individual members of the Placer County Citrus Colony. The sides of this ridge are being terraced by their owners and planted to oranges, from plans made by me, and the work in part has been done under my supervision. In the spring of 1888 the

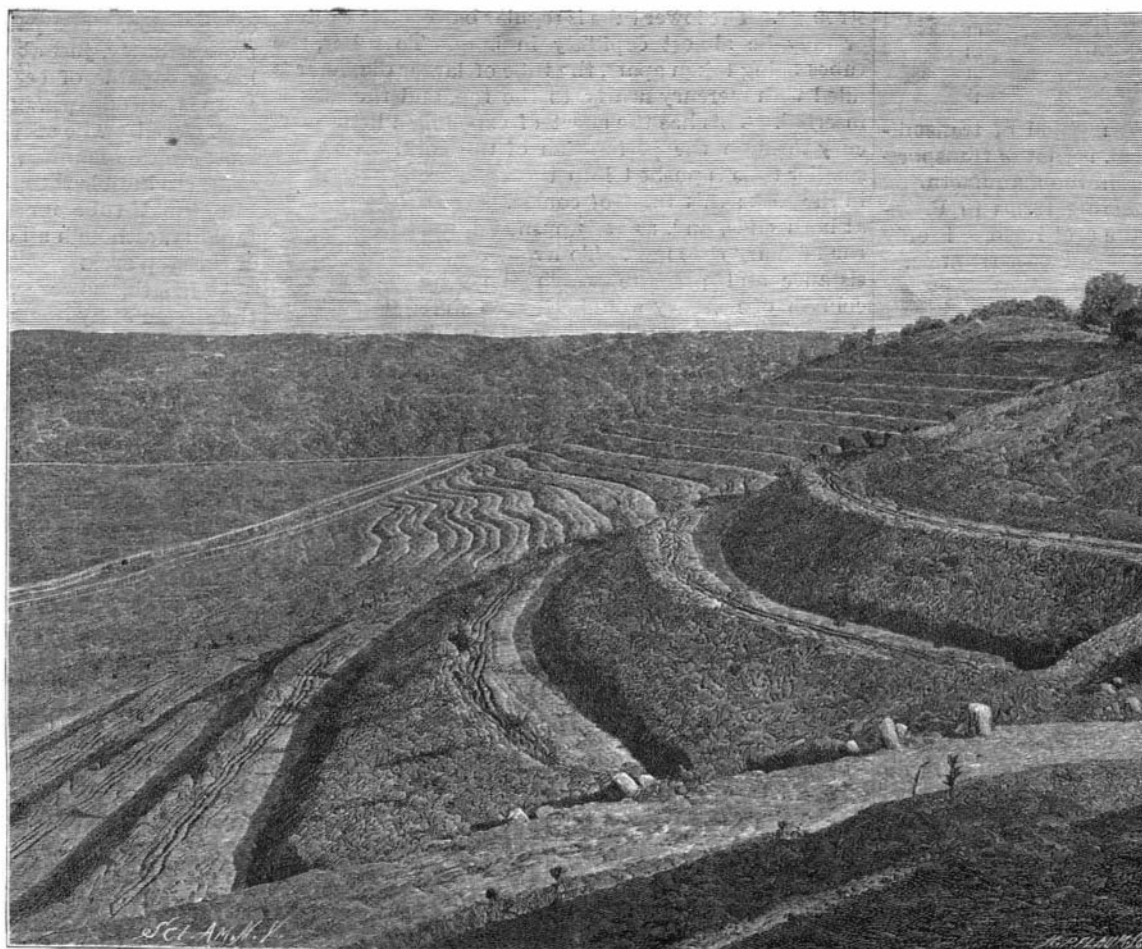
Colony Club. Beginning just below this house, I built a zigzag avenue up the center of the spur to the top, on a regular grade of twenty inches to the rod. This makes an easy carriage road, the steepness of the hill being overcome by the continuous curving. After the terraces were made, I paved the gutters on the upper sides of the avenue, changing to the opposite side at each curve. Pipes were laid across the road as the gutter changed sides, four inch pipe being used on the upper turn, increasing to eight inch pipe at the lower crossing, as in a rainfall the water is greater in quantity at the base than at the top of the terraces. From the highest part of this spur that was to be planted I began the terraces on each side of the avenue, the first being only a few rods in length, increasing with each terrace until the base was reached. The terraces terminate at the side of the avenue, and have a grade of two and a half inches to the rod for the running of water in irrigating. The terrace step was made level, with a bank slope of 45 degrees, varying according to the steepness of the hillside. The width of the terraces as measured on the slope was about 25 ft. on an average, but only from 12 ft. to 20 ft. was the width of the level part. Sidehill plows were used in making the terraces, and they were run back and forth until the work was nearly done, when it was finished with shovels, some dirt having to be taken from high points to low places in wheelbarrows. Recent experience, however, has made me familiar with an implement called a "V," which, following

the plow, does the leveling much more cheaply. This implement should be made especially for this work, which I cannot describe in this article. The trees were planted eighteen feet apart in the row, and near the edge of the terrace, that they might stand centrally over the greatest depth of loosened soil.

Orange trees in this section should be planted in March, that they may become well rooted before summer, when the heat is liable to check their growth if planted late. Since planting this orchard I have been nearly all the time in Southern California, and have frequently visited the orchards of Riverside, Pomona, and Redlands, and I find the trees on these terraces are as large, as vigorous, as healthy, and as uniform in size, as any in the favored sections of the South, that are of the same age and were of the same size when planted.

Among the visitors to this orchard when first planted were some English gentlemen. They were so impressed

with the picturesque beauty of the place and the surrounding country, that they purchased land adjoining, and in the spring of 1890 began to terrace and plant the hillside south of the terrace planted in 1888. Continuing last spring, they now have nearly one mile in length of the hill slope terraced and planted, and many more acres are to be planted in the neighborhood during the coming season. These terraces are irrigated by several lines of pipes laid from the top running down the face of the hill to the bottom. The distance between these lines of pipe is 330 ft. The pipes are laid under the ground, with faucets attached and coming to the surface, just at the base of each bank. Each terrace can thus be supplied with water by the opening of a faucet, and the trees can be irrigated for a distance of 330 ft., when another line of pipe is reached, this continuing along the entire length of the orchard. Near the center of this planted tract is an avenue that runs diagonally over the face of the

**HILL TERRACES, CALIFORNIA.**

work was begun on a spur of land projecting from the ridge, containing ten acres. This lies west from Penryn two and a half miles, northwest from Loomis equally distant, and in plain view from either place. Near the base of this hill, and at the point of central approach, is a cottage house, neatly built of split granite, that is now being used as a club house, for the

ridge to Clover Valley. I have made a paved gutter on the upper side of this avenue, into which runs all surplus water when irrigating, and all that may accumulate on the terraces from heavy rains. A deep furrow is plowed at the base of each terrace to conduct this water to the gutter.

Many Englishmen have already located here, some