

security it yields from the insidious enemies of mining—the gaseous emanations, weak and foul air, the causes of many a calamity and great destruction of life in the past history of coal mining. But no earthly good without its attendant drawback, which in the use of the fan system of ventilation, is that the “breeze of wind” passing along the working ways dries all accumulated dust, and should a blown-out shot or an isolated explosion occur, the almost imponderable dust is diffused so as to make it a dangerous, inflammable and explosive mixture. This contingency is provided against, so far as possible, by sprinkling water in the dry and dusty districts of the mine. Besides the large fan is another on the Murphy plan for use in case of emergency. In an adjoining building is the engine for this auxiliary fan and also an air compressor, going night and day supplying power for small pumps and hoisting gear in dipping places below.

On the way to the No. 1 shaft we see a forest of prop-wood of all sizes and lengths, and piles of lagging for timbering the mines, rolls of Hessians (canvas) prepared with tar, for curtains, to divide and turn the air; food for mules, and these with the numerous supplies used daily in working the mine, are loaded on cars and put on the cages at the surface landing of the shaft in the intervals of hoisting runs of coal. We ascend the steps to the pit-head of No. 1, about twenty-five feet above the ground. This pit-head or bank, is built of heavy balks of fir, 16x16, set crosswise, so as not to obstruct the flow of air and yet sustain the weight and pressure of the pit-head winding frame and gear which rises to a height of fifty feet above the platform of the bank. The pit-head is well housed, and is a snug refuge from the winter's storm. The cages are kept from swaying, by four-corner guides of wire rope stretched taut and up and down these ropes they slide—the guides use up a mile of rope. The banksmen receive the cage as it comes from the pit, and, with the celerity of continuous practice, withdraw the laden cars, replace with empties and dispatch the cage at once for more. The full cars are weighed, sent to the “tippler,” and turned over into the railway waggons. In passing over the screens the dross and smaller lumps are separated from the lump coal by the shaking of a steam jigger and thus the coal is double screened and cleaned for shipment. The operations are so rapid and almost automatic, that it takes a sharp eye to follow them. At the weighman's office the numbered tag is removed from the car, the weight marked down on the output sheet, and tag hung up, so that when the miner comes off his shift, he receives his tags and notes his daily gain. At the month's end a summary of the daily output is spread on the outside of the weigh house for the use of all. Here, also, are posted the reports of the miners' own examiners on the state and condition of the mine, as to safety and freedom from gas. The pit mouth and the surface landing are guarded by fences or lifting gates raised and lowered by the cages, and thus the unwary are protected. The chutes for townsmen's use and reception of refuse rock and dirt, and the manure from the stables below, are in constant use. The crippled mine cars are switched off to a repair shop, where they are refitted with wheels, mended and strengthened over all, until, when past all carpentry, they too increase the dump. The heap of broken wheels shows the stress laid on these cars. While on the

tippler, in a twinkling, the wheels are oiled before the return below. From the pit's mouth to the coal is 650 feet, with a sump for water lower down. The mine is relieved of the water that accumulates beyond the capacity of the sump and a lodgment by a Cameron pump of twenty-eight-inch cylinder and four-foot stroke which forces up the water to the surface in a four-inch column, discharging seventy gallons per minute. Water is not a trouble here. Leaving our friend, the chief weighman, who is Nanaimo City's Auditor we seek the motive power of this great work. Close at hand the giant lives in the engine room of a finely appointed house. The engine driver has his hand on the lever and his eye on the indicator, showing the different heights of the cages in the shaft. Looking round we see the fireman's record book—and being left open, we read—'tis for the information of all concerned, and we are on next morning shift. “Bar. 30.2. Examined all the working places and found all safe. James Price.” “Bar. 30.4 at 2 p.m. Examined all the working places at 2 p.m. and found all clear. M. Harris.” These readings of the barometer are recorded by the fireman at each shift (thrice a day) from an instrument standing in the engine room, and the report of safety is made to the officer in charge of the mine before a man can travel to his place. Four telephones decorate the ante-chamber. All branches of the works, pits and wharves have telephone connection, and with the Superintendent's office.

The powerful winding engines rest so solidly and evenly on their massive bedding that though going at tremendous pressure, and with all the force of their 500-horse power, the movement of the connecting rods, plunging away with an oily ease, causes not the least vibration. At each fresh start the immense drum over forty feet in circumference round which the steel cables coil and uncoil, speeds round so rapidly as to cause a pleasant zephyr in the heated room, and the cables to which the cages are appended, seem to leap to the top of the lofty shaft frame and to drop over the pulleys vertically into the shaft. The swift movement of the engines, and the gliding of the cables, that can lift six tons at the rate of thirty feet a second, is fascinating and leaves an impression not soon effaced. The signal, a steel spring, moved by a lever, pulled from the pit's bottom by a wire rope, and falling on a gong, keeps incessantly striking, for lowering or lifting the coal-laden cages, and at times a precious human freight, which is done with seemly care. The engines are of an improved modern type for winding; they are built by Oliver, of Chesterfield in England, are of high pressure, direct acting, with thirty-inch cylinders, have Cornish valves, and move with a sixty-inch stroke, working generally under seventy pounds of steam. The hoisting cables are of the best crucible steel wire made—over a quarter of a mile in length is used. The cables are daily inspected. An enormous cog-wheel is provided for attachment and working pumps of thirteen-inch column if ever the aid of such a power should be required. The hoisting capacity of the engines is 3,000 tons a day. The steam service for all the engines above and the pumps and engines below necessarily demands an extensive range of boilers, and the boiler house with its high brick stack is furnished with double-flue boilers, four feet by twenty-five feet, supplied by heating feeder; their furnaces are