"*Distribution of Power.*—The methods employed in transmitting power from the engine to the different parts of the mill may be classed under three types, represented respectively by the Highland, Homestake, and Golden Star Mills. The Caledonia may be placed with the Golden Star, and the Deadwood, Golden Terra, and the Father de Smet with the Highland, notwithstanding local variations, especially such as are necessitated in the Father de Smet by the peculiar arrangements of the batteries.

"(1.) In the Homestake mill the continuation of the engine-shaft forms the one line-shaft of the mill, and is placed on the battery-sills. This is a cheap construction, and gives a solid foundation for the boxes in which the line-shaft rests. The shaft is kept in line by the even pull of the long belts placed on each side, at an angle of about 30 degrees. The supposed advantages of being obliged to stop the entire mill if anything happens to the line-shaft is insignificant. When the mill was built, in 1878, the line-shaft was not made of sufficient thickness, in consequence of which it became twisted, and broke within two years. The new shaft, having requisite strength, has been steadily in use ever since. For minor repairs the position of the shaft is a disadvantage. It is in an obscure place, where it escapes attention, particularly as everything has to be done by artificial light.

"(2.) In the Golden Star mill the power is transferred from a small main-shaft to two line-shafts cam-floor, the main shaft being nearly on the same level. This arrangement is favoured by the builders on the Pacific Coast.

"(3.) In the Highland mill (see plate) the main shaft is placed between the cam-floor and the battery-floor, and is connected with two line-shafts placed on the battery sills behind the mortars.

"Both the Golden Star and Highland mills have two line-shafts, which is probably necessary, considering the power required for a 120-stamp mill. The disadvantage is that the pull of the belt on the one side only of the shaft has a tendency to draw it off the line, and also causes great wear-and-tear. As to placing the line-shafts in front of the batteries, on the cam-floor or behind the battery-floor, there is a diversity of opinion. The arrangement at the Golden Star Mill gives the best light in the mill, and makes the shafts easily accessible. The power from the engine-shafts is transmitted to the line-shafts, and from there to the cam-shafts, by long belts, which are nearly horizontal. They require no tighteners, and last longer than those of either the Homestake or Highland mills. On the other hand, the boxes of the line-shafts rest on transverse sills on the cam-floor, which, although braced and strengthened in various ways, cannot furnish the same sure foundation as that at the Homestake and Highland mills. Experience has shown, however, that this disadvantage is more than counterbalanced by the smaller consumption of belts, and the easy accessibility of the line-shafts. The Highland mill has the line-shafts on a sure foundation of the battery-sills; but the darkness and exposure of the line-shafts thus placed behind the mortars, to the buckling of water and fine ore, are serious disadvantages. Again, the belts from the main-shaft down to the line-shafts, and from these up to the cam-shafts, are short and steeply inclined, requiring powerful tighteners, which cause an increased consumption of belts. The mill, however, like the Homestake, is so arranged as to leave the battery, with the apron and sluice-plates, free from any superstructure.

"In the following table the particulars as to shafting-belts, &c., are given:—

Name of Mill.	Line-shafts.			Rock-breakers.		Character and Size of Belts.											
		Diameter in Inches.				Main to Line-shafts.			Line- to Cam-shafts.			Line to Crusher-counter Shafts.			Crusher-counter to Crusher Shafts.		
	Number.	Near Engine.	At Opposite End.	Number.	Type.	Type.	Ply.	Width.	Type.	Ply.	Width.	Type.	Ply.	Width.	Type.	Ply.	Width.
Homestake	1	7	4½	5	E	..	..	..	G	5	14	H	..	18	G	4	9
Golden Star	2	9	4½	6	E	G	6	28	G	5	16	G	5	12	G	5	10
Highland	2	7	4	6	E	H	..	41	G	5	12	G	5	12	..	..	..
Deadwood	1	7	4	4	E	..	..	..	G	5	12	G	5	12	..	..	..
Golden Terra	1	7	4	4	E	..	..	..	G	5	12	G	5	12	..	..	..
Father de Smet ..	2	5½	3⅝	5	E	..	..	..	G	6	12	G	5	24	..	..	..
Caledonia	2	5 5/16	4½	1	F	G	5	28	G	5	12	G	5	24	..	..	..

NOTE.—E, No. 5 Blake rock-crusher. F, No. 6 Gates crusher. G, Rubber. H, Leather.

"The relation of the horse-power of the engine to each stamp averages for the seven mills about 1·7 to 1. This low figure is due to the larger number of stamps in each mill—80 to 120—which is much higher than the common average in gold-mills.

"*Supply of Water and Fuel.*—In this district the supply of water is chiefly furnished by two companies, at prices varying from 2s. to 2s. 3d. per stamp per day, the supply being brought in ditches. In winter water becomes scarce, and then the Homestake management are supplied in part by pumping from the Homestake and Deadwood-Terra Mines. This water otherwise runs to waste. The Big Highland mill would be obliged to stop four months each winter if the tailings from the Homestake, Golden Star, and Highland mills were not settled and the clear water pumped back into a supply-tank. The method by which this is done is simple and effective. The tailings from the three mills are discharged into a creek called the Gold Run. A little way further down this creek widens out, and is closed by two dams, one below the other, forming two reservoirs. The upper overflows into the lower, which is four times its size, and this in turn has its overflow into the bed of the creek. The dams consist of cribbing filled up solidly with waste rock. On their upper sides they are lined with watertight planking. Down the middle of this runs a wooden