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made in using several separate engines for hoisting, pumping, milling, etc., involving five or six cylinders to be cooled and re-heated, causing a great waste of fuel, when, by a proper arrangement of gearing, one large engine, of the best and most economical type, could be made to do all the work. There is frequently an enormous waste of fuel from this cause alone.

The next point to be decided is one which is so closely allied to the previous one that it must be considered with it, viz.: that of transmission of power, one of the most important subjects in mining, because power must in every case be used for many purposes, and at many places, both above and underground. I find a tendency among mining men, and even mechanics, to advocate some one form of transmission as superior to others, while the truth is that each form (direct steam pressure, compressed air, electricity, rope driving, belt driving, shafting, etc.) has some special advantage, and is better suited to some particular case than any other. For instance, if a mine were so situated that only hoisting, pumping and perhaps a small amount of drilling, had to be done a short distance from the boilers, it would be more economical to use steam direct than compressed air or electricity, each of which consumes power in the transformation by compressor or dynamo; if so situated that a Cornish pump may be driven direct from the main engine, or even by a separate engine with early cut off, and reasonable expansion, it would be much more economical than a steam pump, to which steam must be carried a long distance, and used without expansion, as is common with underground pumps.

Compressed air is admirably suited to underground working. It may be transmitted in ordinary pipes having only the average capacity required, and the pressure maintained by means of receivers at almost any distance from the supply. It may be used in ordinary pumps, drills or other simple apparatus which are easily managed by miners, and in use does not cause any inconvenience from discharge; on the contrary, aiding in ventilating to a small extent. On the other hand, it is attended by considerable loss from the accumulation of heat in compressor, and decrease of pressure by cooling. These losses may be overcome to some extent by compound cylinders, reheating, etc., all of which adds to the complication of the machinery, and consequent additional expense and care. Electricity is perhaps the most flexible and convenient of all forms of transmission, because by a simple copper wire it may be conveyed long distances and furnish power for pumping, drilling, haulage, etc., or may be converted into light or heat. Since its use for these purposes is comparatively new, there is much room for improvement in the apparatus, and in the presence of gas in coal mines it may be dangerous from sparking or defective connections, but time will no doubt overcome these objections to a very great extent, and render its use as successful and popular for underground operations as it has become for street car propulsion and other uses above ground.

Although it may be necessary or expedient in some cases to use several forms of transmission for the surface and underground working of the same mine, there would be a great advantage in point of economy of fuel, attendance and repairs in using one source of power, and one form of transmission for all purposes. For instance, if one or more large steam engines of the most economical type could be used to compress air, or generate electricity for distant or underground work, and hoist directly, there would be a great saving of fuel over a number of small engines, pumps, compressors or dynamos. A large mine, to a greater extent than almost any other operation, presents constant opportunities for the mechanic's skill and invention, and since there is always a large amount of material to be moved and operated upon, economy is only to be obtained by performing every possible function by mechanical means. The conditions are so varied that the best mechanical knowledge and original invention is required, and the mechanic, equally with the mining engineer, has the power to make success or failure.

The moral to the investor in mining properties is, make sure of a good mine, under the management of a capable and experienced mining engineer; and to the mining engineer, get good mechanical advice and assistance. I have nothing to say against the advice given gratis by manufacturing concerns, which is frequently honest and valuable, if it is not entirely disinterested, but an independent mechanical engineer, who has had experience in mining operations, and who is employed directly by and for the mine, should be of great assistance, both in selecting and arranging the plant and in operating it.

THE COAL FIELDS ARE ENORMOUS.

The Canadian Pacific Railway is going to get no bonus from the government towards the construction of the Crow's Nest railway. That seems to be taken for granted. On the contrary, it seems to be taken for granted that some effort will be made to re-invest the people with the valuable coal fields which the British Columbia politicians alienated to themselves and their friends. Just exactly what these coal fields amount to in extent or in value the World has hitherto been able to tell only in a general way. We have stated that they included every variety of coal—lignite, bituminous and anthracite; that there were known to be thirty-two consecutive seams exposed to view, one of them being thirty feet wide and thirty miles long; that the combined width of the seams was 180 feet. The Telegram last night produced evidence to show that the coal fields in question are even more valuable and more extensive than we had been informed. According to information furnished the late W. H. Howland in 1892, by an expert, the Crow's Nest property is said to be the finest coal property in North American. The yield of coal per square mile of territory is estimated at fifty million tons, while the whole amount of tons of coal embraced in the coal lands now controlled by the Canadian Pacific Railway is "almost inconceivable." The market for the Crow's Nest coal promises to be a very profitable and extensive one. The Great Northern Railway will distribute large quantities of it throughout Montana, Idaho and Washington, while the Canadian Pacific Railway will handle the coal throughout the mining districts of British Columbia. The railways themselves will consume immense quadtities of it. All the smelters and steam plants within 500 or 600 miles of the coal fields will be supplied from this source. Not only will the Canadian Pacific Railway soon possess all these valuable coal fields, but it will be subject to no regulation as to the price at which it shall be carried over the railway. By this deal, which Messrs. Jaffray and Cox engineered between the British Columbia Southern Railway and the Canadian Pacific Railway, the latter corporation becomes much more monopolistic than ever. It owns all the coal fields and can dictate whatever freight rate it pleases. What is Mr. Laurier going to do about it? What course does the Globe intend to pursue? Will it advise the government to disallow the Act of 1896, which seems to be the only loophole left the people for freeing themselves from the bondage of the Canadian Pacific Railway? Or will it continue its academic denunciation of monopolies until the time arrives when disallowance will be impossible? Let the Globe read its anti-coal-combine articles that we reproduced the other day.—Toronto World.