

MR. JAMES McARTHUR.

THE subject of the accompanying sketch is Mr. James McArthur, present President of the British Columbia Marine Engineers Association No. 1, which was formed at Victoria, B. C., in the early part of 1890. Mr. McArthur was one of the charter members, and has from the first taken a very lively interest in the organization and success of the Association.

Mr. McArthur is a son of old Scotia, having been born at South Queen's Ferry, Scotland, on the 22nd of March, 1850. He commenced to learn the engineering trade at an early age, serving an apprenticeship at the Paragon Works of James Dundas, of Dundas, Scotland. After working as a journeyman for a short time, he left Scotland in the employ of Tennant & Co., of Perth, by whom he was sent out to British Columbia in 1871 in charge of four traction engines for the late Mr. F. Barnard, who intended to use the engines to haul supplies to Barkerville. The enterprise, however, fell through, owing to the bad state of the roads, although Mr. McArthur succeeded in getting the engine he was in charge of considerably farther than was believed possible.

Mr. McArthur was next employed by the Kurtz & Lane Co. as engineer at the mines at Cariboo, but the mines not paying well, he returned to Victoria and engaged as chief engineer of the steamer "Cariboo Fly" for Messrs. Moody, Deitz & Nelson. Leaving this firm he became master mechanic for the Hastings Saw Mill Company for three years. In 1875 he purchased a half interest in the stern wheel steamer "Beaver," which ran on the Stickeen river. The following year she was lost, and Mr. McArthur returned to Victoria and took service in the then new Pioneer Line founded in 1877 by Capt. John Irving. He has since remained with this company, now the Canadian Pacific Navigation Co., Ltd., and is now chief engineer of one of the best boats, the "R. P. Rithet."

Mr. McArthur is a man who has made a host of friends, and by dint of hard and steady work and shrewd investments has accumulated a good share of this world's goods. He is married, and has a family of bright boys and girls. He is a prominent member of the Freemasons, Odd-fellows and A. O. United Workmen, of the last he is a charter member. Having the confidence and esteem of his employers and the respect and admiration of his friends, Mr. McArthur is to-day one of the most popular engineers in British Columbia.

NEW INSULATING MIXTURE.

A NEW insulating compound called "volute" is thus described: it is composed of a mixture of gelatine (specially made), resin oil, oxidized linseed oil, resin and paraffine. It is cheap, and contains no sulphur. The proportions of the mixture are: Glove glue (*colle de gant*), 1,000 parts; resin oil, 100 parts; oxidized linseed oil, 500 parts; colophane, 150 parts; paraffine, 250 parts. The glue is prepared by taking the refuse clippings of gloves, and soaking them in cold water for one night. The next day they are strained, and washed in several waters until the water is clear. In an iron boiler there are then placed 1,000 parts of water, five parts of carbonate of soda, and dry glove skin 250 parts. This is boiled for six consecutive hours, the water being renewed as it evaporates. The whole boiling mass is next run over a sieve, across which steam is passed to prevent the gelatine coagulating. The boiling solution is received by a wooden tub, through which a current of warm air is passed for one hour. The residue left in the sieve is boiled up with water for three hours, and when filtered can be used again for dissolving the glue, but this time with only 200 parts of glove skin. The gelatinous solution is put into a boiler with the olein or oleic acid used in candle manufacture in the proportion of gelatinous solution, 1,000 parts; olein, 80 parts. This is boiled for half an hour, after which ten parts of caustic potash solution (fifty parts water) is added. The boiling is maintained for an hour, so as to saponify the olein and form a soapy pulp. The glove glue pre-

pared, resin oil, linseed oil, colophane and paraffine are added in the proportions above stated; the whole is boiled until homogeneous. This boiling generally lasts about four or five hours.
Revue Industrielle

QUESTIONS AND ANSWERS.

"W. I." writes: Can you inform me as to what is wrong with my engine? It is a slide valve cylinder 12" x 20", revolutions 200 per minute. It seems to run very well until the large planer goes on, and then it loses speed.

ANS.—You do not give data enough for us to answer your question. Your governor may be at fault, your steam pipe may be too small, the valve may be set wrong, or be leaking, the piston may leak, or perhaps the engine is too small. Send us along full data and we will try to help you out.

"J. D." writes: I have a 6" single leather belt running 1,600 feet per minute. The driver is 40" in diameter, and the driven 18". What horse power should this belt deliver?

Rule.—Divide the number of square inches in contact with the pulley by 2; multiply this quotient by the velocity in feet per minute, and divide by 33,000. ANS.—You will have 4 ft. of belt contact on small pulley lever $48" \times 6" = \frac{288"}{2} = 144" \times 1,600 = \frac{230,400}{33,000} = 7\frac{1}{4}$ very nearly; it would be safe to say 7 $\frac{1}{4}$ H. P.

"Engineer" asks: What would you recommend for taking out the scale that has become pretty badly crusted on the flues and bottom of a boiler?

ANS.—Slippery elm, flaxseed, ground sumac or any other mucilaginous seed or bark thrown into the boiler will loosen the scale, which can then be removed through the hand holes. When using any substance to remove scale, the boiler should not be allowed to run too long without cleaning out, as the loosened scale may accumulate on the bottom of the boiler and cause the sheet to burn.

"T. W." says: I am making a glass plate electric machine. Can you tell me how I can make the hole in the centre of the plate? I have tried twice but broke the plate each time.

Answer: Glass may be readily drilled by using a steel drill, hardened but not drawn at all, wet with spirits of turpentine. Run the drill fast and feed light. Grind the drill with a long point and plenty of clearance, and no difficulty will be experienced. The operation will be quicker if the turpentine be saturated with camphor gum. Large holes will require a tube-shaped tool with fine teeth like a rose-bit, using the same solution.

"J. M." asks. What would be the best way to determine the horse power a given belt would be capable of transmitting?

ANS.—The horse power of belting or the tractive force exerted by leather bands of a given width at a certain speed expressed in foot pounds or in any other positive way, is not generally known. There are some half-dozen rules professing to give a unit for horse power, but they are obviously incorrect. A horizontal belt of a given length will drive more than a vertical belt of the same length, a long belt more than a short one, and a twisted belt more than either, because in the case of the horizontal and the long belt the sag and weight tend to produce closer contact and resist strain better than where the belt merely hugs the pulley by its tension; the same is true of the crossed belt which embraces more of the circumference of the wheel driven. From six to eight hundred feet per minute for a one inch belt is said to give a horse power; three to four hundred for a two inch belt will give the same, and so on in inverse ratio.

Mr. J. P. Crawford recently delivered an interesting and instructive lecture on "Electricity and its Application to Light and Heat" before the members of the Hamilton Association.



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