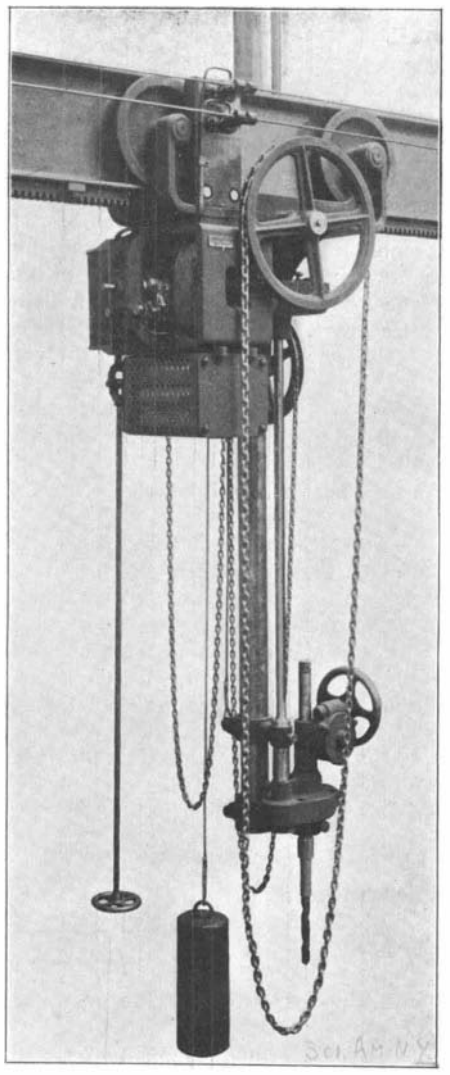
SWISS TRAVELING CRANE TOOLS.

BY F C. PERKINS.

One of the most interesting and practical electrically-operated machines now in general use in the machine shops of the leading manufacturers in this country and abroad is the overhead traveling crane. It is now considered by most engineers that the overhead traveling crane operated by electric motors is a necessity for the rapid and safe handling of all heavy work, and for moving the tools themselves when portable. It is becoming more and more the practice to use separate electrically-operated portable tools, bringing them in succession to the heavy work requiring their use. In order that the electric cranes may operate in all the parts of the shop, reaching every tool, or every large piece of work to be tooled, there must be no overhead obstructions, and we find this another reason for the direct-connected electrically-driven tool, with its entire absence of overhead pulleys and shafting. The Maschinenfabrik Oerlikon, of Oerlikon near Zurich, have recently designed an attachment for electric cranes, whereby the tool electrically operated is directly mounted upon the crane, and may easily be brought to the work to be drilled at any part of the shop. The motor is controlled from below where the work is being done, and a suitable counterweight balances the drilling apparatus, allowing it to be easily moved up or down. A direct-current motor supplies the necessary power. The electric cranes are operated by either alternating or direct-current motors, although the latter are more extensively used at the present time, on account of the ease with which they may be controlled, and the great range of speed possible with the direct-current motor. The alternating-current motor has, however, the advantage of having no troublesome commutator, and may be made practically ironclad. Where the induction motor can be used, not even slip rings and brushes are necessary, which is a decided advantage; but in most cases slip rings and brushes are found quite necessary, in order to introduce resistance on starting, and hence alternating-current motors for this class of work are not as extensively used as direct-current motors.

A weighing device suspended from a crane would undoubtedly find extensive use, as any heavy piece of work could easily be raised and its weight noted without difficulty.

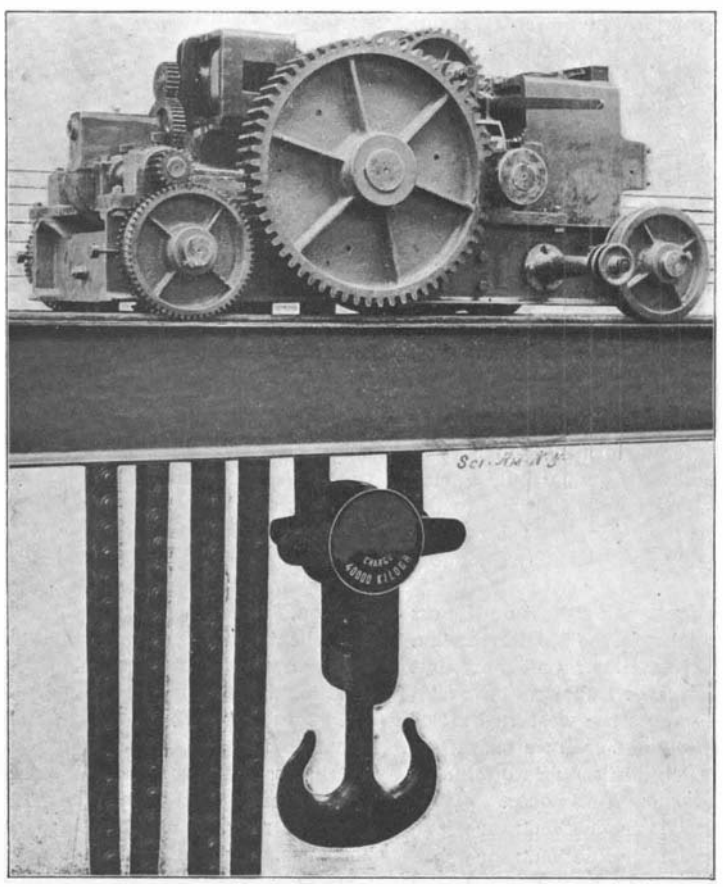


OERLIKON SUSPENDED ELECTRIC DRILL.

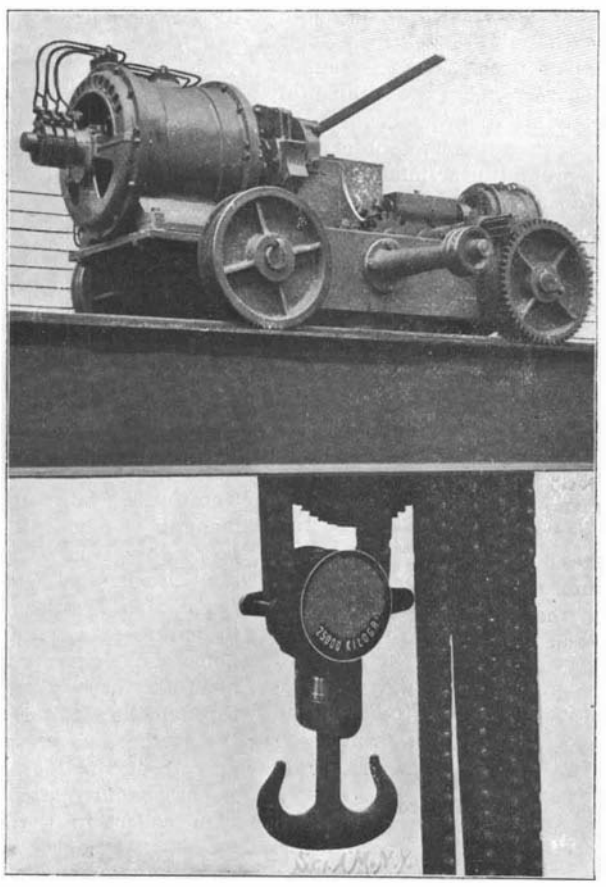
A New Valve Gear.

An ingenious new valve gear, especially for locomotives, the utilization of which results in a more economical consumption of steam than is possible under present conditions, has been devised by Mr. James Thompson Marshall, of Leeds, England. The most salient feature of the contrivance is the position of the eccentrics on the crank shaft. The leading eccentric is fixed 180 deg. in advance of the crank. The second eccentric is placed 90 deg. in advance of the first eccentric, and thus secures in combination with the crank three variations of speed. The first or leading eccentric is connected with the center of the radius link, and the second eccentric actuates a rocking shaft which communicates through the radius link and valve rod—the characteristic movement of the invention. This movement is different from the travel of the ordinary gear, since the valve rod instead of oscillating with regular rapidity, pauses at the end of each stroke both forward and backward, a sufficient time to permit in the one case, the maximum of steam to enter the cylinder, and in the second case, to give the steam ample time to escape. The economical advantages of this new gear are greatly increased haulage power, owing to the ease with which the steam is passed in and out of the cylinders, reduced steam pressure and a correspondingly smaller consumption of fuel, and a considerable reduction of "back pressure." "Back pressure" is one of the special troubles of the engineer. How to get the waste steam away quickly enough has long been a difficult problem. The difficulty has been largely solved by the Joy valve gear, but this invention differs from the Marshall contrivance in dispensing with eccentrics. In the case of the latter gear the valve remains stationary between its opening and closing movements, and thus on the one hand, the steam obtains freer entrance, and on the other, passes out more quickly than where the movement of the valve rod is constant and not variable. Similarly the blast is improved. Instead of a quick, jerky draught, there is a long sustained exhaust not so destructive to the fire. As to the mode of entry of the steam by the employment of the Marshall gear the liability of the motive fluid to be withdrawn is obviated. Frequently when steam enters a cylinder it does so at a pressure of 15 or 20 pounds below that indicated by the boiler. But with the Marshall gear the same pressure is gained in the cylinder as that indicated by the boiler.

The Great Northern Railroad has been experimenting with the gear upon one of its mineral traffic engines. The results were highly satisfactory, for in the trial the locomotive hauled from 30 to 45 trucks of coal at a saving of 8 pounds of fuel per mile, and under a steam pressure 20 pounds below normal. With a converted passenger engine running with a dining car express comprising 17 cars, 2 pounds of coal per mile is saved. The new valve gear works so satisfactorily that the driver can contrive to keep in reserve fully 30 pounds of steam.



FORTY-TON OERLIKON TRAVELING CRANE OPERATED BY DIRECT CURRENT MOTOR.



OERLIKON ELECTRIC CRANE OPERATED BY THREE-PHASE ALTERNATING CURRENT.

Bacteria on Mont Blanc.

In the Comptes Rendus of the Paris Academy of Sciences, M. Jean Binot prints an account of his researches in the observatory on the summit of Mont Blanc, where he has been conducting bacteriological investigations at the highest altitude yet explored. As was to be expected, the air on the summit, away from the observatory, contains scarcely any bacteria whatever, only from four to eleven being detected in as much as a thousand liters, while in somewhat similar volumes none whatever was found. As a rule, at lower altitudes, the number of bacteria increased, as, for instance, at the Plan de l'Aiguille fourteen, and at the Montanvert forty-nine were found in a thousand liters. Inside the observatory, in which M. Binot spent five days, from 260 to 540 microbes were found in the same volume of air, these being probably introduced by M. Binot and his companions during their temporary invasion of the building.

The investigations were not, however, confined to the air on the top of the mountain, but included also bacterial examinations of freshly-fallen snow, old snow, ice on the surface and below, glacier water, and mountain streams. Freshly-fallen snow, even when sampled in large quantities, frequently contained no bacteria whatever, while in snow which had lain for some time usually only from one to two individuals were discoverable per cubic centimeter; at the foot of the glaciers the surface snow contained rather more, the number varying from six to sixty-five per cubic centimeter at the Mer de Glace. Glacier water is usually very pure, and, like the glacier ice from which it is derived, was found to contain a number of yeasts and some streptothrix; but while high up such water contained but from three to eight bacteria per cubic centimeter, a stream at the foot of the glacier des Bossons contained ninety-five, while the water of the River Arve, at Chamonix, was found to have as many as 7550 per cubic centimeter. Altogether, M. Binot examined 121 samples of air, ice, snow, and water, and isolated no less than 300 different varieties of microbes, one-third of which number he was able to identify as having been already studied and described, and the residue are being carefully investigated by him at the present time. Even the alluring and beautifully clear and crystalline spring water on the Montanvert road was condemned by being found to contain a dozen virulent colon bacilli in a cubic centimeter. Doubtless, this pollution was due to the cattle on the mountain.

A large foghorn is to be placed in the cliff of St. Lawrence, 4 feet in diameter and 12 feet long, the sound being produced by sirens. Compressed air is supplied by valves actuated by clockwork. Every two minutes the foghorn will emit a deep roar, followed ten seconds later by a sharp shriek. There are three air tanks, each 6 feet in diameter and 12 feet long, and three gasoline engines run compressors to fill these tanks. The plant runs automatically, and a constant pressure is maintained in it. Even the clock is wound by a compressed-air motor. The horn is mounted on a revolving track, so that the sound can be directed toward any point.