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NOVEL HYDRAULIC RAILWAY LOCOMOTIVE.

A new mode of traveling has lately been invented, which the inventors claim to be applicable to any mining country where flumes exist, or which may be used wherever a stream of water of sufficient velocity of current can be inclosed for suitable distance. The device involves a carriage driven entirely by outside power; and paradoxical as it may appear, it is caused to travel either in the same direction as the force, or diametrically opposite thereto, while the direction of application of the power remains unchanged. In short, it is a carriage which travels up stream, impelled by no other force than that of the current. The invention is claimed to be practicable; it has already been used in California for transportation on a small scale; and judging from experiments, the inventors state that a car for the transportation of passengers, as shown in our engraving, may thus be driven at considerable speed, depending of course upon the head of water.

The carriage rests on ordinary flanged wheels which traverse rails laid on the edges of the flume. On the axles are attached paddle wheels, which correspond in shape to the section of the flume, and are acted upon by the current therein. It is clear that the current turning the paddles will so rotate the wheels of the vehicle, which will consequently move in a direction opposite to that of the current. When it is desired to move in the same direction as the current, the paddles are stayed stationary, and the water impels the car down stream.

A test trial with a working model, we learn, has demonstrated the capacity of the carriage to carry about 8 lbs. of load (exclusive of its own weight) for every inch (miner's measure) of water in the flume. A flume of 600 inches of water will therefore furnish power to transport a load of about 5,000 lbs. up stream, on any grade from 4 to 20 inches to the rod, at a speed of from 4 to 8 miles per hour; a less grade causes a slower run. The strength of flume and car is the only measure of capacity of the device in going down stream, and the velocity may extend to any speed desired, being governed only by the grade and the speed of the flow of water. The rate of travel is regulated by brakes; and the paddle wheels are attached to the shafts with clutch gear, to be unshipped at pleasure.

The frame is built in two sections, and the platform rests on anti-friction balls, for the purpose of turning curves with but little friction. By double gearing, the speed may be greatly increased for passenger transportation, of course at the expense of power.

This invention was patented through the Scientific American Patent Agency, November 7, 1876, by Messrs. C. A. Leaman and John A. Heckart, of Pentz Ranch, Cal.

In some localities, damp-proof courses in walls are formed of slates set in cement: these are liable to crack, and thin impervious stones are better. Sheet lead has been used for the same purpose, and is most efficacious; but it is expensive.

A New Method of Making Glass Signs.

Mr. Henry A. Goetz, of New Albany, Ind., has patented through the Scientific American Patent Agency (January 2, 1877) a new method of making gilt signs, etc., on glass. The usual mode of procedure consists in roughly painting the letters on one side of the glass; then on the opposite side the letters are carefully painted in gold size. On this the gold leaf is laid, and when the whole is dry the superfluous gilding is removed. The letters are then shaded by hand. Mr. Goetz' process is much more simple and expeditious. He begins by covering the glass where it is to be lettered with gold or silver leaf, having previously applied a coating of isinglass size. Then a yellow, hard-drying ink is applied to the gilded surface with elastic type, in such places as are to retain the leaf. When this ink becomes thoroughly hard and dry, the surplus leaf is removed with whiting, applied with a damp

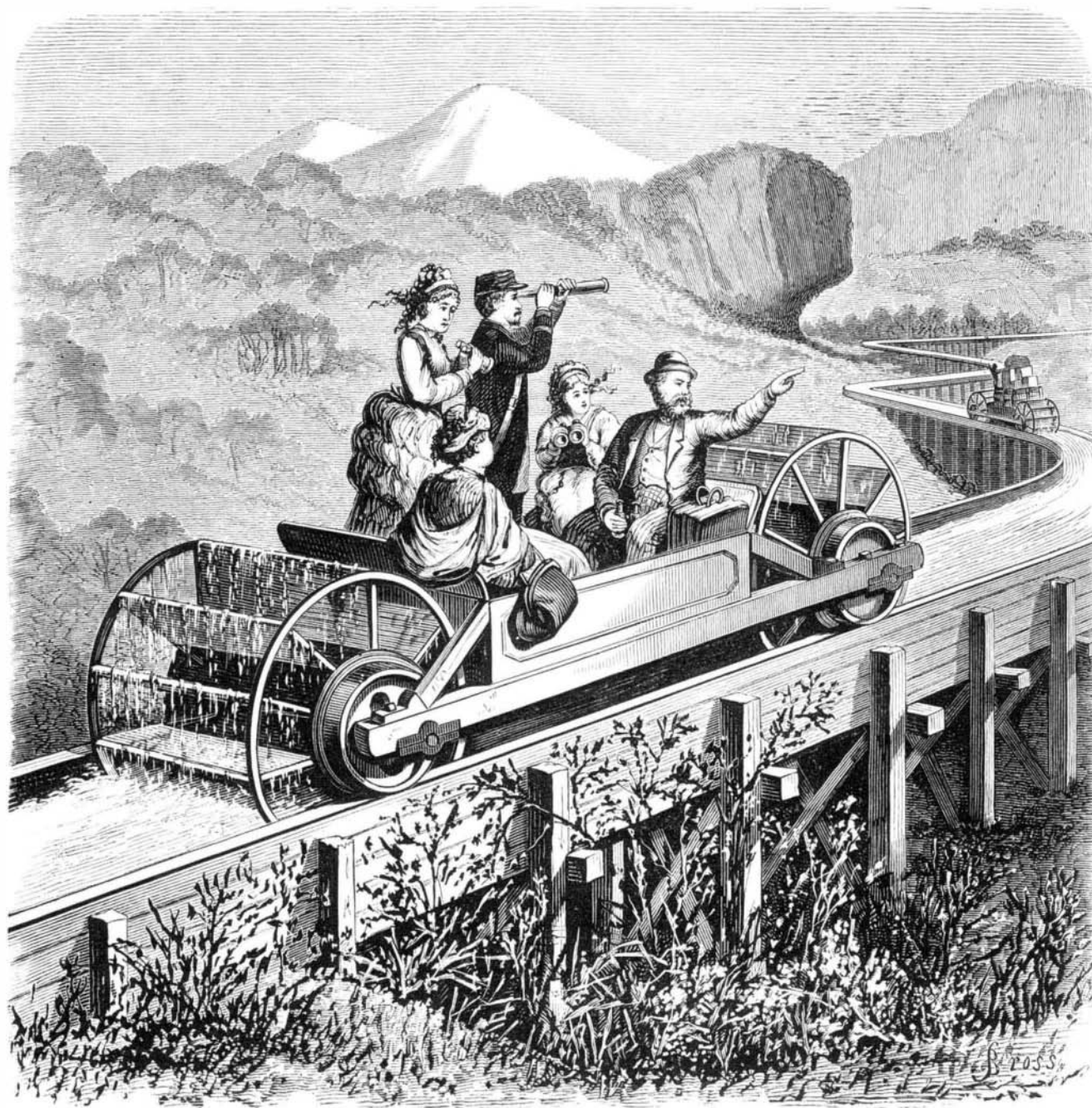
Treating Lubricating Oils.

Heretofore it has been necessary to mix hydrocarbon, or mineral lubricating oil with a considerable proportion of fatty oils, to give it the necessary body or viscosity, but these fatty oils (both animal and vegetable) are all more or less oxidizable in the air, producing gummy matter becoming very acid; and if left in warm places on cotton, wool, clothes, sawdust, or similar material, are exceedingly liable to spontaneous combustion. For lubricating the pistons of high pressure compound surface-condensing engines, both marine and stationary, the fatty oils are particularly objectionable, for, in addition to the before mentioned faults, the high pressure steam decomposes them into fatty acids and glycerin, which are, of course, carried into the boilers, where the fatty acids corrode most powerfully, and with the glycerin make a kind of soapsuds, producing excessive priming.

But Mr. Humfrey, of Chester, England, claims that he is able to produce mineral or hydrocarbon lubricating oil of such a body that no mixture of fatty oils whatever is required, the viscosity being equal to the best olive, and considerably superior to sperm; while being perfectly neutral, it cannot act on or corrode the condensers nor boilers, nor form concretions in the cavities of the pistons and steam passages; nor does it act on the india rubber valves of the air pumps to any injurious extent when used for internal lubricating of steam engines. For ordinary lubricating it is perfect, as it forms no gum or acid, and it is absolutely safe from spontaneous combustion, with a lubricating power equal to sperm. The oil treated by his invention is also specially suited for lubricating fast running machinery, and for all kinds of fast running mechanism. He first submits the oil to careful fractional distillation, and collects the heavy portion of the product. In the refining or chemical treatment, instead of agitating the chemicals with the oil by means of paddles, screws, or other mechanical means as have heretofore been used, he forces a large stream of compressed air through a pipe at or near the bottom of

the vessel, by which very important advantages are obtained. As well as a most thorough and complete agitation, a considerable effect is produced, powerfully aiding the action of the chemicals used; at the same time, the great volume of air passing through carries off all traces of oils of low gravity and boiling points, the result being lubricating oil possessing more body and higher specific gravity and flash point than any mineral lubricating oils heretofore produced, making it specially adapted for lubricating the pistons, slide valves, and other parts of the marine, locomotive, and other steam engines, steam hammers, and other apparatus. The oil may be produced from coal, shale, peat, bitumen, asphaltum, petroleum, and other oil producers as is found most economical and convenient.

THE bark of slippery elm has been recommended as a preventive of boiler incrustation.



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pledget of cotton, while the lettering or ornamentation is retained by the ink. The shading, or the outline of the shading, is now printed on the glass with elastic type in any required color. When this becomes dry, hand work may be added, if desired, and the whole backed up in the usual way.

Number One, 1877.

We would remind those of our Western subscribers who have failed to receive our first of the present year that the mails, carrying that number of the SCIENTIFIC AMERICAN, were burned at the recent destruction of the Ashtabula, O., railway bridge. We will supply the missing number gratis, to those subscribers who have not received it, on receipt of postal card request.

At Pomeroy, O., at a depth of 104 feet, a petroleum well, supplying nine or ten barrels of oil a day, has lately been opened.