THE WETLI MOUNTAIN RAILROAD AND ITS DISASTROUS TRIAL TRIP.

Among the various means proposed of late years for building lines of railroad on the steep slopes of mountains, that of M. Wetli, of Zurich, Switzerland, has attracted considerable attention from European engineers. We have already laid before our readers the system of central toothed rails used on the Righi and other mountain roads in Europe. In the Wetli system, instead of this rail and the pinion on the vehicle engaging it, there is a drum having a helicoidal thread which engages with triangular rails. This drum is attached to the locomotive. The construction will be readily understood from the illustrations given herewith, which we take from *La Nature*. The thread on the drum is precisely that which would be formed could a rail similar to one of the central angular rails be wrapped around it; so that it always is in contact with the mid rails, and necessarily prevents any bodily sliding or rolling of the vehicles over the regular track when the drum is held motionless. The V-shaped mid rails are securely fastened to horizontal iron ties, which rest on wooden traverses. The angle of the V is 50°; the distance between any two traverses is 2·8 feet.

The locomotive has three coupled axles, on the mid one of which the drum is attached so as to be raised or lowered to engage the rails at the will of the engineer: it being possible to cause it to act on the rails with a pressure of 3·7 tons. The diameter of the drum is 2·14 feet. Its spiral thread is of steel, very solidly attached, and so made as to grip the rails to a distance of 0·6 inch below the level of the track. In order to insure this contact, on the drum axle are two pulleys which run on the exterior road, and of which the diameter determines the depth of the hold of the threads. These pulleys are 34·7 inches in diameter, while the driving wheels are very slightly in excess, to provide for the use of tyres.

M. Wetli's invention, as we have described it, was placed between Woedensweil and Einsiedlen, Switzerland. The difference in altitude between these points is 1,513 feet, the distance 9·6 miles. The grade is from 4 to 5 per cent over the first six miles of the way, and subsequently decreases to 1 per cent. The Wetli railroad was established last October only on the heavy grade, that is, the first six miles which very many of the rails were broken, M. Welti re-adjusted the drum thread. Finally, he concluded that he had overcome all difficulties in his apparatus; and accordingly a formal trial was arranged on November 30. For about four and a half miles of the ascent the drum worked well; and the hoarfrost, with which the rails were thickly covered, showed good contact. Afterward it worked irregularly; but the station of Schindelleghi, a distance of five miles, was reached without accident, the locomotive dragging a car loaded with 20 tons of rails. It was then attempted to make the descent by the aid of the helicoidal drum; but this jumped the rails, and broke them almost immediately. By the aid of back pressure of steam and brakes, the locomotive was stopped. Then, unfortunately, the engine was started again; but hardly had the descent been resumed when it was evident that the drum was not holding, and that the speed was accelerating rapidly. Brakes and steam were both found useless, and the engine went tearing over the rails at the rate of a mile a minute. Of the fourteen persons in the vehicles, three were thrown out and killed, and the rest were more or less seriously injured. The heavily loaded car left the track, and tore up both central and side rails until its coupling broke. The engineer, with great intrepidity, clung to his engine, coolly giving signals to open switches so that the locomotive might run upon the level track and so expend its momentum; but the engine left the rails at a sharp curve, destroyed the track for about a hundred feet, and finally stopped a mass of ruins, with its brave engineer mortally wounded. Whether the Wetli system can be made to work as intended by the inventor is regarded as doubtful by the engineers who have examined into the causes of the disaster.

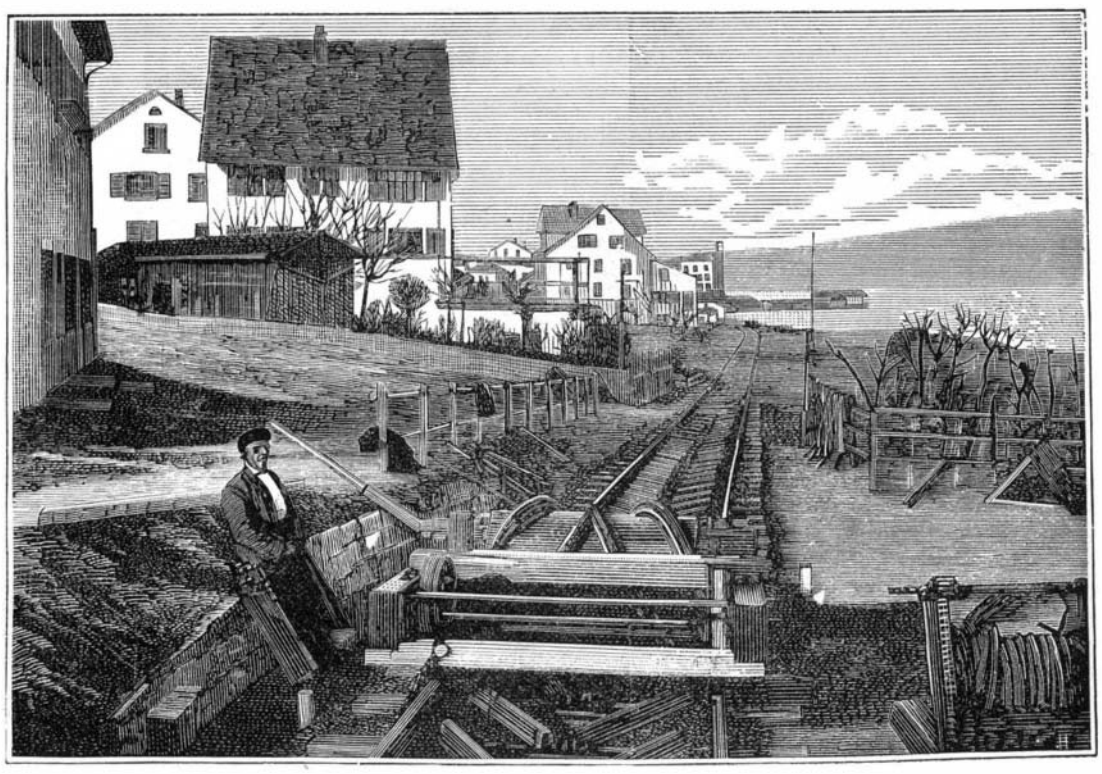
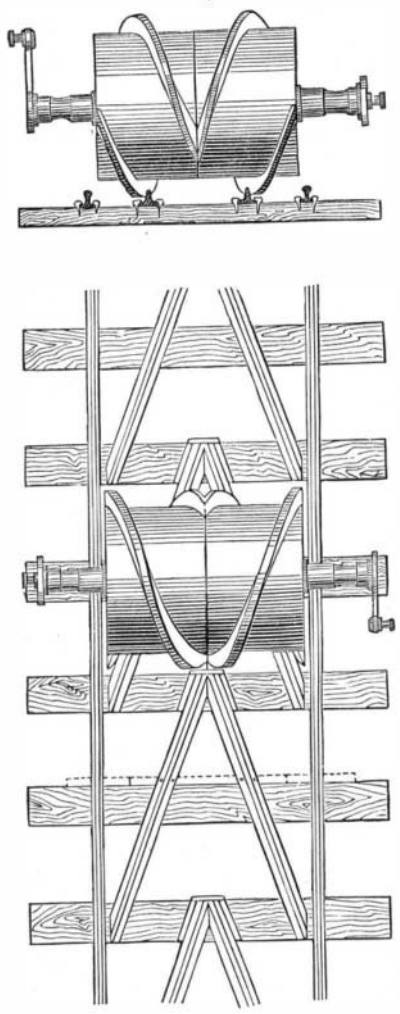


Fig. 1.—THE WETLI MOUNTAIN RAILROAD.

Fig. 2.



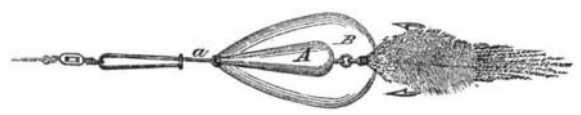
Early in November, trial trips were made which did not prove satisfactory. Sometimes the drum thread gripped the triangular rails properly and acted well; again it would wedge itself upon them, and often would simply roll over their tops without engaging at all. After the first trials, during

Absence of White Color in Animals.

Some very curious physiological facts bearing upon the presence or absence of white colors in the higher animals have lately been adduced by Dr. Ogle.. It has been found that a colored or dark pigment in the olfactory region of the nostrils is essential to perfect smell, and this pigment is rarely deficient except when the whole animal is pure white. In these cases the creature is almost without smell or taste. This, Dr. Ogle believes, explains the curious case of the pigs in Virginia adduced by Mr. Darwin, white pigs being poisoned by a poisonous root which does not affect black pigs. Mr. Darwin imputed this to a constitutional difference accompanying the dark color, which rendered what was poisonous to the white colored animals quite innocuous to the black. Dr. Ogle, however, observes that there is no proof that the black pigs eat the root, and he believes the more probable explanation to be that it is distasteful to them, while the white pigs, being deficient in smell and taste, eat it, and are killed. Analogous facts occur in several distinct families. White sheep are killed in the Tarentino by eating *hypericum crisicum*, while black sheep escape; white rhinoceros are said to perish from eating *euphorbia candelabrum*; and white horses are said to suffer from poisonous food where colored ones escape. Now it is very improbable that a constitutional immunity from poisoning by so many distinct plants should, in the case of such widely different animals, be always correlated with the same difference of color; but the facts are readily understood if the senses of smell and taste are dependent on the presence of a pigment which is deficient in wholly white animals. The explanation has, however, been carried a step further by experiments showing that the absorption of odors by dead matter, such as clothing, is greatly affected by color, black being the most powerful absorbent, then blue, red, yellow, and lastly white. We have here a physical cause for the sense-inferiority of totally white animals which may account for their rarity in nature. For few, if any, wild animals are wholly white. The head, the face, or at least the muzzle or the nose, are generally black. The ears and eyes are also often black; and there is reason to believe that dark pigment is essential to good hearing, as it certainly is to perfect vision. We can therefore understand why white cats with blue eyes are so often deaf—a peculiarity we notice more readily than their deficiency of smell or taste.—*Dr. Wallace, British Association*, 1876.

IMPROVED TROLLING HOOK.

Mr. Henry C. Brush, of Brush's Mills, N. Y., has patented through the Scientific American Patent Agency an improved troller, the novel feature in which consists in attaching a float to the shank of the implement under the revolving blade, the object being to keep the troller near the surface of the water, where the fish may see it more readily, and whereby the liability of catching in weeds and logs is obviated.



A is a float, attached to the shank, *a*, of the troller. B is the spoon, which is swiveled in the usual manner. The device is very simple, and is claimed to prevent all the annoyance arising from the hook catching in sunken obstructions.

Leghorn Hens.

If a man keeps Leghorns he must have no garden, or he must cover the top of his hen yards. That Leghorns are great layers and active hens, there can be no denying, but they are great flyers. We have built our yard a lath and a half high, says the *Poultry Review*, but what do these saucy things care for that? Although they have the whole outside world to range in, yet the garden seems to have a greater attraction than all the rest. The other day we found it necessary to feed a weak chicken in the garden by itself, so that it might be sure of its share. A few minutes afterwards, on looking out of the window, we discovered the weak chicken in the henyard and two Leghorn hens finishing up its food. We went out, but the two robbers had fled. Going around the corner, we found them rolling in a flower bed. A Leghorn will do as much mischief in a garden in five minutes as anything we know of.

Sawdust in Rough Casting.

Siehr recommends very highly the use of sawdust in mortar as superior even to hair for the prevention of cracking and subsequent peeling off of rough casting under the action of storms and frost. His own house, exposed to prolonged storms on the seacoast, had patches of mortar to be renewed each spring, and after trying without effect a number of substances to prevent it, he found sawdust perfectly satisfactory. It was first thoroughly dried and sifted through an ordinary grain sieve to remove the larger particles. The mortar was made by mixing 1 part cement, 2 lime, 2 sawdust, and 5 sharp sand, the sawdust being first well mixed dry with the cement and sand.

SUINT FOR WATERPROOFING FABRICS.—A German chemist has patented the waterproofing of finely woven fabrics, linen, cotton, etc., by means of suint composition. He adapts his method to securing the suint to wool-washing establishments at a small cost.

Purification of Wool and Woolen Stuff.

The process, patented some time ago, for the removal of straw, burrs, etc., from wool, by treatment with sulphuric acid, has been modified by Lisc as follows: The stuff is worked for one to two hours in a bath consisting of about 26 gallons sulphuric acid, of 3° to 6°, 1 lb. alum, ½ lb. salt, and 750 grains borax. It is then treated in a centrifugal machine, and afterward subjected to a temperature of 212° to 248°. For removal of the acid it is first washed with pure water for 1½ hours, then treated for two hours with fuller's earth, soda, and lime, and finally washed for two hours with fresh water. As sulphuric acid can only be employed with uncolored cloths, or such as have been dyed with indigo, chloride of zinc and chloride of manganese diluted to 6° are substituted with fabrics otherwise dyed.

Caffeone.

Caffeone, the aromatic principle of coffee, may be isolated by distilling 5 or 6 lbs. roasted coffee with water, agitating the aqueous distillate with ether, and afterwards evaporating the ether. It is a brown oil, heavier than water, in which it is only very slightly soluble. An almost imponderable quantity of this essential oil will suffice to aromatize a gallon of water.