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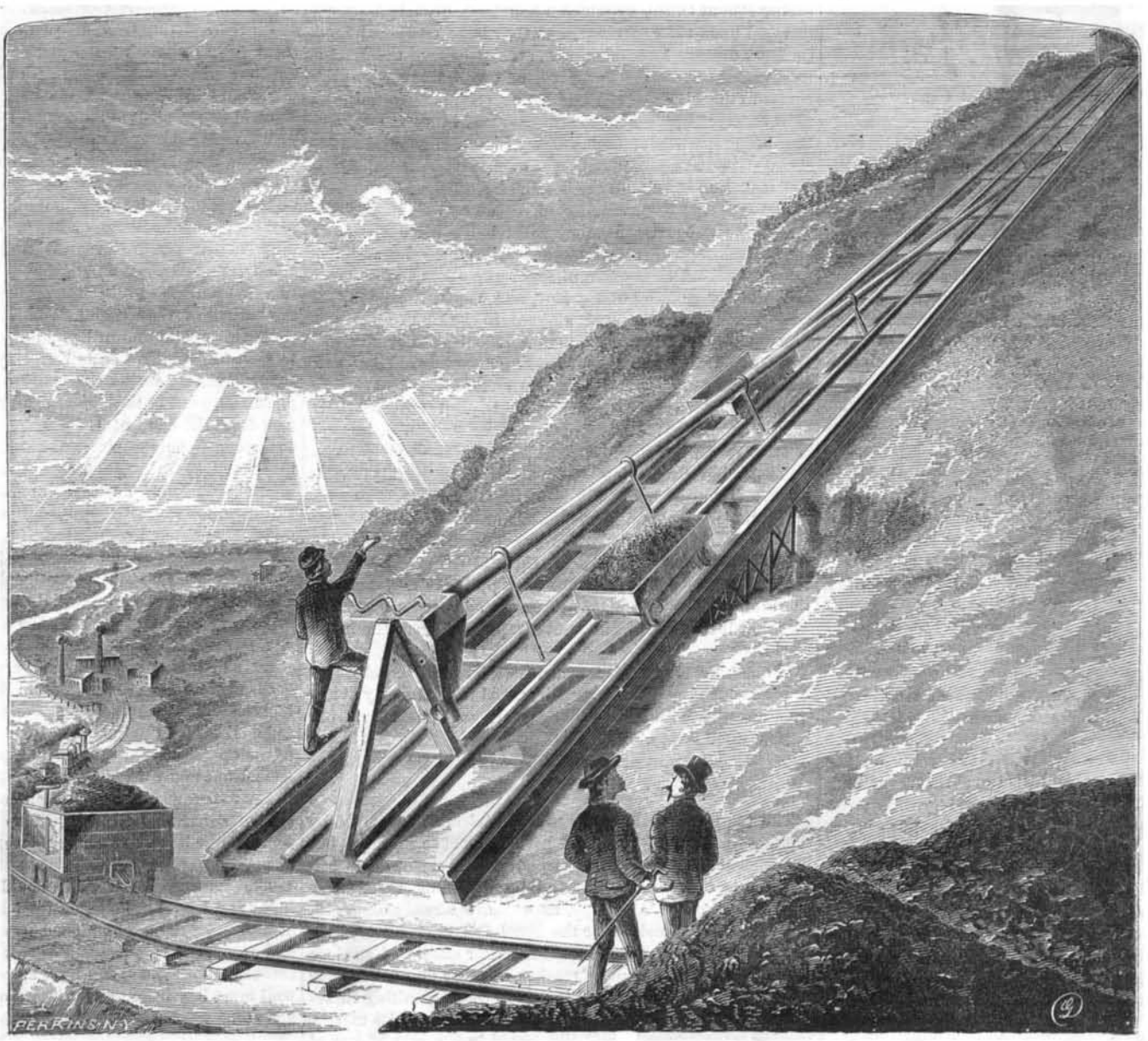
HILL SIDE RAILWAY.

We illustrate in the accompanying engravings a novel form of lowering railway, applicable, as will readily be perceived, to almost any case in which it is required to transport loads down high and precipitous declivities. It consists, briefly, in two self-balancing carriages, provided with reservoirs for the reception of fluid or granulated material (as shot), running upon suitable tracks. Other stationary receptacles are arranged upon the latter so as to supply the carriage reservoirs at suitable times with a quantity of the water or other movable weight, the particular object of which will be explained as we proceed. In Fig. 1, a general perspective view of the entire apparatus is given; in describing the details reference is made to Figs. 2 and 3, which are respectively a representation of the bottom of one of the carriages and a plan view of the tracks and fixed receptacles.



DU BOIS' HILL SIDE OR LOWERING RAILWAY.

The cars, A A, are connected together by means of a long rope, B, which passes up and around the grooved wheel, C. The latter corresponds in diameter to the distance between the centers of the tracks, and revolves in a plane parallel to their surface, transversely and longitudinally; in brief, the rope leaves the periphery of the wheel in the same line whatever may be the position of the cars along the length of the rails. The cars, as we have above stated, are self-balancing, that is, the weight of one exactly counterbalances that of the other, and in order to move them it is only necessary that a sufficient force should be exerted to overcome their inertia and the friction of the mechanism. Beneath the platform of each vehicle is arranged a tank, D, Fig. 3, which is provided with an opening and spring valve, at E, and a receiving spout at F. On its lower portion, and between the rails, is a reservoir, G, connecting with a wide receiver, H, by means of a tube, I. The receiver, H, is placed, as shown, near the upper end of the track, and its sides extend out under the rails. The reservoir, G, has in its bottom two spouts and sliding covers or valves, which are actuated by the handles extending above at J.

Fig. 2

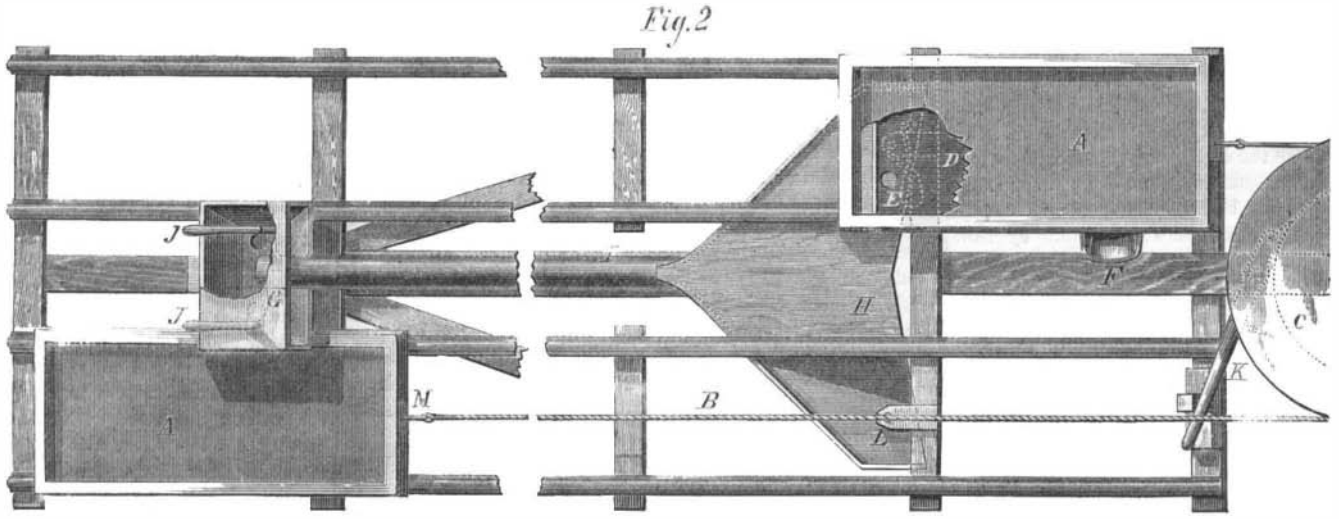
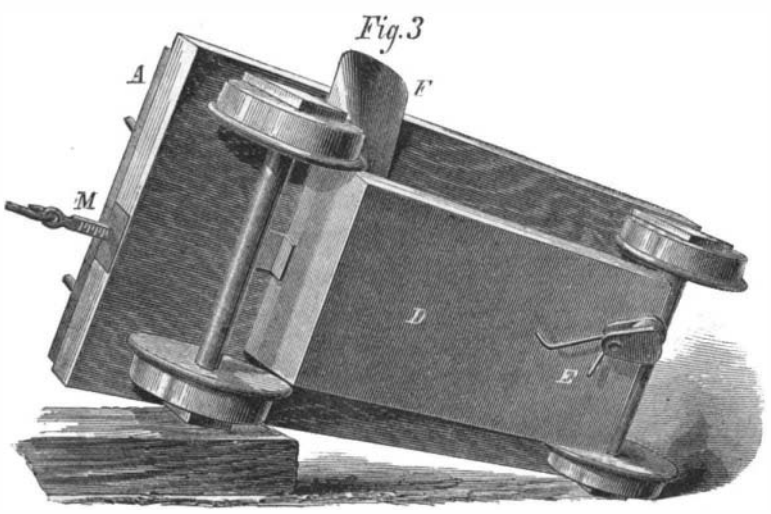


Fig. 3



To understand the operation of the apparatus, let it be supposed that coal, for example, is to be transported from the top of the mountain. The car at the upper end of the track is loaded and started down, its descent being regulated by the brake, K, on the wheel, C. Of course, by the rope, B, the second car is thus drawn upwards. As soon as car No. 1 is at the bottom, car No. 2 reaches the top. Car No. 1 is now unloaded. It is evident, however, that as the coal is removed the weight of car No. 2, which is being filled above, will gradually counterbalance that of car No. 1, and hence begin its downward motion, probably before either filling or emptying is completed. To avoid this, the reservoir, G, is previously filled with water or shot, and one of its bottom spouts, by handle, J, being opened, its contents are allowed to enter the tank beneath the car by the spout, F. This additional weight partially compensates for that of the coal removed, so that the upper car does not overbalance the lower and now empty car until the full load is in a place when there is a slight though sufficient difference in weight in favor of the loaded car, to cause it to start down the decline. Just before the empty carriage, which is of course thus drawn up, reaches the top of the track, an arm on its valve, E, strikes a projection, L, between the rails and underneath the car. The spout which valve, E, when shut, closes is thus thrown open, and consequently the contents of the tank empty into the receiver, H. From the latter the shot or water instantly descend the tube, I, refill the reservoir, G, to be again drawn out, as above described, into the car now at the bottom. The eyes for connecting the rope, B, to the cars, are attached to a rod M passing under the latter, and arranged in connection with a spiral or other spring. By this means the rod being suitably graduated, a balance is formed which indicates the weight of the load upon the car.

The principle involved in this novel invention is capable of a wide and general application, and from its use a material saving is effected in the cost of handling heavy articles which require to be lowered from one point to another. It may, by suitable modification, be arranged in buildings, the carriages ascending and descending vertically. If fluid be employed in preference to shot, alcohol or other spirits would be substituted in winter to prevent freezing, a proceeding involving very little expense as there is very little waste of the liquid used. In reference to special instances where it is considered that the device may be advantageously employed, the inventor enumerates the following: "In all elevated sand or gravel banks and brickyards; in stone quarries such as are along the Hudson river and Eastern coast; in ice houses, especially such as are situated on Rockland Lake, N. Y.; in cement quarries or mills, as those of the Newark Company, at Ron

dout, N. Y.; in coal mines, as exist upon the hills near Pittsburgh; in warehouses on high banks, as are found near Wheeling, Va., and Vicksburgh, Miss., and for moving lumber, as at St. Anthony." It requires but one person to attend to the lowering of the heaviest bodies. The apparatus may also be employed as an elevator, for the ascending platform can be weighted with such articles as it is desired to raise, instead of the usual counterbalancing weight, an advantage which applies to all cases in which the device may be used.

Patented March 18, 1873. For further information address the inventor, Mr. Charles Du Bois, Fishkill-on-the-Hudson, N. Y.

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NEW YORK, SATURDAY, OCTOBER 18, 1873.

Contents:

(Illustrated articles are marked with an asterisk.)

PATENT PLANING MACHINE LITIGATION.

Among the most memorable litigations that ever took place in this country in connection with patents, were those pertaining to the Woodworth Planing Machine, originally patented by William Woodworth, December 27, 1828, for the term of fourteen years, and twice extended by Congress, for fourteen additional years. The monopoly became so burdensome and oppressive that the legislatures of various States passed resolutions imploring Congress to grant no further extensions, and it finally expired in 1856, after an existence of twenty-eight years.

Woodworth's device was an improvement on Hill's machine, which was defective in that it did not reduce the boards to a uniform thickness. Woodworth arranged the cutting cylinder above the bed; and in connection therewith used yielding pressure rollers to hold the boards in proper position. He thus obtained a new and important result, to wit, the production of planed lumber of uniform thickness. This gave him the almost exclusive monopoly of mechanical planing, from which he or his assignees realized great wealth. Many attempts were made to break down his patents, but they usually failed. A great variety of devices were brought forward, designed to evade the claim of Woodworth to the yielding pressure roller. In some of these the pressure was applied upon the edges of the board by weights; in others by springs upon the face of the board; in others by iron bars resting upon the boards and pressed down by springs. But the courts held that all these devices were infringements, producing substantially the same results as Woodworth's rollers and were therefore not substantial departures from his contrivance.

When the Woodworth monopoly expired, the lumber interests received a great impetus. Manufacturers were freed from the great tax, and the number of planing machines rapidly increased. The dealers little thought that, after the lapse of seventeen years from the expiration of the great original monopoly, an attempt would be made under color of law to saddle another and even greater monopoly upon them. But we are sorry to say that this was the fact.

In 1848 Joseph P. Woodbury applied for a patent for an improvement in planing machines, in which he used a yielding pressure bar instead of Woodworth's yielding pressure roller. Lock Woodworth's roller so that it will not turn, and we have, substantially, Woodbury's pressure bar. Long prior to 1848, the courts had decided that the use of yielding pressure bars were infringements on Woodworth's yielding pressure rollers; and therefore, while Woodbury's patent might have been new and patentable, he could not have used his device, had the patent then been allowed. But the Patent Office decided that there was not sufficient novelty in Woodbury's device to support a patent, and accordingly rejected his claim. The applicant then withdrew his petition, and received back his money. As he could not obtain a patent, everybody who made planing machines had a free right to use his device, and they did so. Woodbury's invention is now to be found employed on almost every planing and molding machine in the land.

In 1870, Woodbury renewed his application for a patent, but was again rejected. The Patent Office decided that its former decisions were correct. In January, 1873, the applicant again renewed his petition, and again the Patent Office decided to sustain its previous decisions and rejected the case. On the 29th of April, 1873, the Patent Office again revived the matter, and decided that all its previous decisions were good for nothing, unreliable, and consisted of a tissue of blunders. So the patent was allowed, and the Woodbury party now flaunt the document in the faces of the lumber planers and molders, demanding payment of a heavy royalty under threat of instant stoppage of their mills.

The lumber merchants and manufacturers throughout the country, are naturally alarmed and indignant to find themselves overwhelmed, as it were, by this decision of a floundering Patent Office, by which a merciless grab is now attempted upon their earnings, and they have combined for a common defense by legal means. They believe the patent to have been wrongfully granted, and will fight it in the courts to the bitter end. The union comprises all of the most enterprising lumber manufacturers in the country, and they are preparing for their defense in the most systematic style. The most prominent legal talent has been employed. The stakes on both sides are immense.

The dealers have agreed, in case Woodbury's claims are sustained by the courts, that they will remove his device from their machines and substitute another, unless he modifies his demand, which is one cent royalty on every hundred feet of lumber or molding of any sort, and which, if paid by all dealers will, it is estimated, amount to the sum of one million dollars per annum. Whether Woodbury's claims will be sustained in the courts is of course uncertain. Some new judicial view of such cases may be announced, or evidence adduced that will nullify the patent. But otherwise, we should expect that the patent would be sustained, because in other cases, heretofore published by us, the courts have, under similar circumstances, invariably sustained the patentee. It may be justly alleged in his behalf that, if he were really the original and first discoverer of this device, the Patent Office committed a serious error in depriving him, for so many weary years, of the rightful fruits of his invention. That the device is one of great public importance, and therefore worthy of a patent, is proven by the remarkable fact that it is used on about every planing machine in the world.

While this is true, it is nevertheless equally certain that the tax which the patentee requires, and which he may at any time increase, will be for many years to come a grievous burden upon the public.

THE PANIC OVER.

The temporary nature of the financial crisis is proved by the fact that, during the short period intervening since our last issue, the excitement has nearly all subsided, and a better feeling of confidence is rapidly becoming restored in monetary circles. Although, as we have already observed, it seems hardly possible for the usual fall business transactions not to feel in some degree the after effects of so close a stringency of the money market, still we do not consider that any serious or extended injury to trade resulting therefrom need be at all apprehended. An example of its merely passing interference is well illustrated in the case of one of the oldest and largest dry goods firms in this city, which, although suspending one day, were enabled to resume payments on the next.

As regards the manufacturing interests of the country, we are unable to find ground for the sinister predictions of many of our contemporaries. With the exception of a probable check to rapid advancement in the construction of some of the new railroads, due to the weakness of public confidence in their securities, and the consequent throwing out of employment of a number of men heretofore employed in building or in manufacturing rolling stock and supplies, we cannot perceive any diminution in the prosecution of our great industries. Factories, founderies, and indeed all similar establishments, so far as we can learn, are flourishing, and a brisk business seems to be the general rule. Moderation, good management, and hopeful waiting for the storm to pass over have been the means of averting or, at most, confining to a few the evil results of a disaster which might have made itself felt throughout the entire business community of the country.

PUDDLE WALLS.

Our correspondent, S. W. G., of Elsah, Jersey county, Ill., writes for information relative to making a fish pond in a valley by constructing a dam across from one side to the other. The essential idea in a dam is its capacity for holding water. To this end it must be of sufficient substance, so that its weight shall secure it from being overturned or pushed away by the pressure of the water. It must also be constructed so as to be watertight.

To secure this last requirement the most effective method is to include within the dam a puddle wall. The correct method of puddling, so simple in itself, is not always practiced. The popular ideas in regard to this important part of the work are erroneous. By many persons it is supposed that the best material for the purpose is clay. This is an error. Pure clay is, in some respects, the worst. Again, it is supposed that the work must be compacted by a rammer. Ramming is not effective in compacting it. There are still other erroneous notions entertained on the subject, but we will perhaps best expose the objectionable methods by simply stating the correct one. If the puddle is to extend across a valley, commence by removing from the surface, where the wall is to stand, all rubbish, brush, grass, roots and other perishable material, as well as all surface soil down to the solid natural gravel or ground. In doing this, excavate a trench equal in width to the thickness of the wall. Make the bottom of the trench level across the bottom of the valley, and extend it into and up each side hill in level benches or steps, so that at all points the wall shall have under it a level surface to stand upon.

Next, the material. This should be a gravelly loam, taken from a bank where alternate layers of gravel and loam, or clay, are found. Screen from it by a rake all stones larger than an egg. Spread it to an even depth of four inches in the lowest trench. Sprinkle water over the whole surface by a hose or buckets until the material is soaking wet, when another layer of dry material four inches deep is to be spread over the first one. A convenient method of regulating the depth is by setting up at frequent intervals stakes projecting eight inches above the bottom of the trench with notches cut four inches from the top. In placing the first layer, the workman is guided by the notches. The second layer is to be carefully graded to the top of the stakes. Now place a plank, equal in length to the width of the trench, across it near one end. Standing at one end of this plank with a shovel, hold it upright, the back from you. In this position push the shovel to the bottom of the trench by aid of the foot on top of the blade, and then push the handle horizontally from you with force. Withdrawing the shovel, move along the plank the width of the shovel; and placing its point in a line with the position it before held, again press it to the bottom of the trench and horizontally from you. Continue this operation until you have moved along the entire length of the plank. In doing this, you have formed a wedge-shaped opening across the trench. In returning along the plank, slice off, in the same manner, about an inch in thickness from the edge of the opening nearest you, pushing it compactly upon the material previously packed. Continue this process, cutting slice after slice, until the edge of the plank is reached. Turning the plank over gives room for more work. Follow this operation until the whole of the material is cut and compacted. In making these cuttings, the water which was put upon the lower layer of four inches is squeezed up through the whole of the upper layer, and the whole thickness of material is rendered of the consistency of putty. The next morning the puddle will be found sufficiently hard to walk upon freely. Then repeat the entire process of spreading the two separate layers of four inches each, watering the first layer and cutting and compacting as before. By this method, double layer upon double layer is to be laid until the top of the wall is reached Some parts of the operation may appear unimportant and thus be neglected, but many who have so thought and acted have found to their sorrow, after the completion of the work, the necessity of adhering strictly to what experience has shown, in some of our largest engineering works, to be the true method of making puddle walls.

The thickness of a wall should be in proportion to its hight and length. For small ponds, a wall four feet broad at top and gradually widened downwards at a rate of one and one half inches per foot of hight on each side, or three inches on both sides, will be of ample strength. The puddle wall must be covered from the air on all sides by the filling and stone work used to form the dam.

THE FIRELESS LOCOMOTIVE.

The locomotive engine, run by steam generated from hot water forced into it from a stationary boiler previous to the start (described on pages 290 of our Vol. XXV. and 118 of our Vol. XXVII.), is gradually fulfilling the anticipations of its projectors, and promises to lead us to a practical substitute for horse power in working city railroads and suburban lines. The improvements, however, leave much to be done; but the imperfections of the present machine are such as are easily remedied by a skillful constructor.

On October 3, a trial of a fireless locomotive took place between East New York and Canarsie. The dimensions of the engine are as follows: Boiler, 10 feet long by 46 inches diameter; two cylinders, 8 inches diameter by 12 inches stroke; two pairs of wheels, 30 inches diameter, coupled; ordinary slide valves, working without expansion, the engine being provided with double eccentrics and links for reversing. The exhanst is blown into two condensers, one for each engine, fitted with 36 five eighth inch tubes for promoting condensation, and air pumps for creating partial vacuum. For the engine, such as it was, apologies were made by Mr. G. L. Laughland, the President of the Fireless Engine Company, and Mr. C. H. Haswell, the Consulting Engineer, and due allowance was made by the visitors for its many obvious imperfections. Its performances were as follows: It left East New York at 2.52 P.M., with the steam gage at 180 pounds, and ran the 3½ miles to Canarsie (down grades) in 12m. 45s. At the end of the trip, the gage showed 108 pounds. During a 9 minutes stoppage, it fell to 104 pounds, and the run back (up grades), in 17 minutes, reduced it to 45 pounds. No fire was nsed on the locomotive, the entire trip having been made by the steam rising from the hot water with which the locomotive was charged at the start. It drew one car with 120 passengers. The net weight of the engine was 4 tuns 3 cwt.; the car itself was estimated to weigh 7½ tuns empty, and with its load 12½ tuns.

The experiment was a successful demonstration of the possibility of running a locomotive by the proposed means; but the poor construction of this particular machine renders it necessary to defer any calculations as to the economy of the device We understand from Mr. Schieffler, of the Grant Locomotive Works, Paterson, N. J., that an engine to be worked on this plan is to be designed and constructed at that establishment.