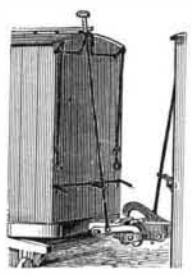
RECENT INVENTIONS.

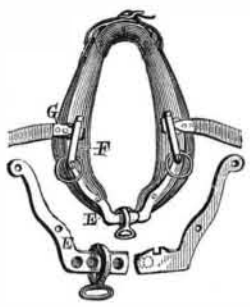
Car Coupling.

Mr. Martin V. King, of Bedford, Iowa, has patented a device for coupling cars, that is operated from the top or side of the car, and is so simple that it may be easily repaired without the necessity of taking the car to a repair shop. A loop is formed on one side of the drawhead of a car, and to the opposite side a hook is pivoted, the hooks and loops of the adjacent ends of the cars being adapted to engage with each other. A rod pivoted to the top of the hook extends to the top of the car, and can be locked by means of a latch on the top of the car that engages with ratchet teeth on the rod. The rod is also connected with a transverse crank shaft on the end of the car, and may be raised or lowered to operate the hook and couple or uncouple the cars, either from the side or top of the car. This coupling is shown in the engraving.



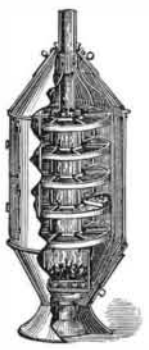
Black's Improved Horse Collar.

The accompanying engraving represents an improved horse collar recently patented by Mr. John Q. Black, of Lone Rock, Wis. The two parts of the collar are secured at the top in the usual manner, and made of a stuffed leather cover, in which the wooden hame is inclosed. Coupling irons, E, adapted to connect the lower ends of the parts, are secured to the hames by a bolt passing through the irons, the cover, and the hames. The tug irons, G, are provided at one end with a T-shaped head, and the opposite end is curved to adapt it to the shape of the collar. The T-heads of the tug irons pass under and are held to the collar by tug plates, F, secured to the hames and collar. By this construction the tug is easily attached to the collar, and automatically assumes the position easiest for the horse, and will change with the change of the draught of the load. The coupling for the lower end of the collar is reliable, durable, and cheap.



Drier for Fruits, etc.

Mr. Hugh S. Jory, of Salem, Or., has patented an improved apparatus for drying fruits and other substances. The casing of the drier is made of any suitable material, and is formed with a cylindrical middle part and conical ends, and is supported in an upright position by legs secured to its lower end. The lower end has openings to admit dry air, and the upper has damper openings to control the escape of the moist warm air. Within the cylindrical part of the casing is placed a frame formed of skeleton shelves. Each shelf is formed of concentric bands connected by radial bars, and they are connected by upright bars attached to the inner and outer bands, the outer bars being extended and attached near the top of the casing to a collar that surrounds the smoke pipe, and the lower to a collar on a standard at the bottom of the casing, on which the furnace is supported. With this construction the fruit placed on the shelves will be dried quickly, thoroughly, and evenly. The invention is clearly shown in the annexed cut.



THE AUSABLE CHASM.

BY H. C. HOVEY.

This remarkable chasm is as truly a cañon as any in Colorado; but, while my object in paying it a recent visit was mainly in order to study its geological peculiarities, I cannot refrain from mentioning a few of those picturesque features for which the locality is justly celebrated.

The Ausable River rises amid the wildest scenery of the Adirondacks, and running forty-five miles in a northeasterly course empties itself into Lake Champlain, at a point nearly opposite Burlington. The fact that it abruptly emerges from a region of mountains and finishes its course amid a succession of sandy beaches, is supposed to have suggested to the French explorers the name Au-Sable (to the sand). A stage road runs from Port Kent to the Lake View House, near the chasm The rise in this distance is 300 feet, but it is mostly near the lake, the remainder being a flat, sandy plain, the cultivated portions of which are given up to buckwheat and beans. So narrow and so hidden is the deep channel cut by the Ausable through this champaign country, as not to be visible to one approaching from the east until he is on its very margin. The road to Keesville formerly crossed the chasm at its narrowest place, by a high bridge, concerning which there are several romantic legends that have probably lost nothing in the telling. One of the best authenticated is the following: After the perilous bridge had been disused and allowed to decay a gale swept it entirely away, with the exception of a single girder. On a dark night a certain clergyman, named Morgan, approached it on horseback. He was returning home after an absence of years, and supposed that the road led, as formerly, over this bridge. On reaching it amid the darkness his horse hesitated, but was spurred onward and carried the traveler safely over; nor did the latter learn of his terrible risk until he was told of it the next morning!

The road now crosses the river by a bridge entirely above the chasm, spanning the rapids near the Rainbow Falls. This fine cataract, said to be 70 feet high with a spread of 150 feet, has been utilized, at very little sacrifice of its wild beauty, by the Montreal Horse Nail Works. The rolling mill, where they roll the best Norway iron into thin bars suitable for their use, is near the Alice Falls, higher up the stream. The wheel-house of the main factory, immediately below the Rainbow Falls, is 115 feet high, three walls being built of stone masonry and the fourth being the wall of native rock. The available fall is 56 feet, with a gain of 3,000 horse power! Through the kindness of the manager I was permitted to go through the entire establishment and see the process of making the twelve sizes of horse-nails, with large and small heads, the body of each nail being soft and uniform, while the points are hardened for driving. On mentioning to the foreman that I was a correspondent of the SCIENTIFIC AMERICAN, he volunteered the remark that once a year he solicited subscriptions from all the men for that periodical, not for a commission, but because those who took it became the best workmen.

A hundred yards below the nail works stands an octagonal building, through which one may reach the stairway of 125 steps, conducting him down into the gorge below. The river here flows through a wide amphitheater, closing around the foaming cataract that is usually spanned by a rainbow when the morning sunlight flashes on its mass of spray. A level floor of sandstone, washed and curiously carved by aqueous erosion, leads down to another cascade known as the Horseshoe Falls. Rocky buttresses are piled around this amphitheater, and between them we pass, by a sharp turn to the right, known as the Elbow, into the famous Ausable Chasm. The wall opposite to the one along which our narrow pathway lies, shows proof of having been subjected, at some time since its original formation, to immense lateral and upward pressure. The strata exhibit a remarkable anticlinal dip, and suggest the idea of a violent cause for this wonderful rift in the rocks. Yet the causes that have combined to complete what was thus begun are for the most part of a more quiet and gentle sort, and are still at work. The observer notices that the walls are polished for 30 or 40 feet above the summer level of the water, and is assured that in winter and spring a tremendous torrent pours down from the melting snows of the Adirondacks, searching for the weakened seams, prying off detached portions, and polishing what cannot yet be dislodged. Sand is carried along with the flood, and does its part in scouring the rocks, the effect often being visible in concentric grooves and rings cut in the flat floor, and occasionally in smoothing the surface as if by art. These polished spots show the grain of the sandstone, sometimes gnarled like blocks of agate, and again in markings like the squares of a checker-board.

The rhomboidal fracture of the rocks is extraordinary. Each fragment seems to obey the same law as that by which the great columns, from 100 to 200 feet high, are separated from the walls. In transverse chasms, such as the Devil's Slide, Shady and Mystic Gorges, Hyde's Caves, and the Smuggler's Pass, are to be seen numberless blocks, each of which is an almost perfect rhomb, while the cross-cañons themselves lie at an oblique angle with the main chasm. Numerous iron stains and seams of iron stone indicate the possibility of chemical decomposition having much to do with the disintegration of the rocks. Frost has also done its work, and the roots of trees and smaller plants have helped to pry the seams apart. In the path of the torrent I observed numerous granite bowlders, one of which must weigh as much as 100 tons. These are signs that the chasm existed in the Glacial Period and was widened and deepened by its action. The whirling of pebbles has pierced the rock in several places with deep wells. I descended into one of these, and remarked the curious fact that it had been bored spirally, as if by an immense screw. This pit was 18 feet deep and about 6 feet in diameter. In another place, and at a much higher level, is to be seen one-half of such a pit of much larger dimensions, the other half having fallen away. A thrifty cedar has found root in the niche thus remaining. Hyde's Cave was measured by me and found to be 60 feet from the entrance to the extremity. Drift-wood lodged within it shows that the winter floods invade the cavity, and have done their work in thus undermining the ledges above.

The path crosses and recrosses the tumultuous flood by means of substantial bridges; and here and there lies along galleries that have been cut out from the face of the rock, or else made by planks supported on iron bars projecting from the wall. There are several small caves besides the one mentioned above, and these are made accessible by stairways. The distance from Rainbow Falls to the Table Rock, where the pathway ends, is one mile by the pedometer, and rather more than that as stated by the guides. Here are the majestic Cathedral Rocks and the Sentinel, columns towering from the water to the height of perhaps 130 feet.

A boat awaits us at Table Rock, capable of seating twelve persons, in which we are to shoot the rapids and explore the remaining mile or more of the cañon. At one point the walls are said to rise above us to the height of 175 feet, while they stand only 13 feet apart, and the water rushing between is 60 feet deep. The fact that the dip of the sandstone strata is here in the opposite direction to the flow of the stream produces a singular optical illusion, and makes it seem as if our boat were shooting down a far steeper declivity than is really the case. The voyage is quickly made, and we glide out of the chasm into a placid basin, on the margin of which carriages await our coming to convey us back to the hotel.

The rocks cut through by this cañon belong to the Potsdam sandstone that is so splendidly developed in Essex County, and from which the Ausable River has cut nearly its entire channel. Ripple marks abound, showing that the sands were deposited from calm waters shallow in depth, with here and there a beach emerging from the wide Silurian sea. Now and then a lingula, or other shell, is found, a relic of paleozoic life, proving that after the ancient beaches had been somewhat hardened they were liable to submergence. The term sandstone, often applied to brittle and crumbling rocks, must not mislead the reader; for the sandstone of Ausable is solidified into a hard quartzite, which would firmly resist the elements were it not for its jointed structure. Its thin laminations, cut by transverse planes of fracture, constitute one of its important characteristics. There are, indeed, two systems of joints, at nearly right angles with each other; and this explains the tessellated floors, resembling pavements, along which the path extends through so large a part of the chasm. It also explains those striking elevations like the pinnacles and columns of a cathedral, or like the buttresses and battlements of some ruined, moss-grown castle. It is instructive to notice that the main direction of the lines of division run parallel with that of the Adirondack range in the vicinity, showing plainly the relation they bear to the general geological history of the region. At some remote time the Rainbow Falls dashed over the precipice that still frowns above the basin that receives the boat on its emerging from the chasm. By slow retrocession, due to the causes herein described, the falls have worn their way back for the distance of more than two miles. The process is still going on, just as at Niagara Falls, but at what rate cannot now be stated. The action of the flowing water, though modified by freshets and changing seasons, is sufficiently constant to be measured, and it is to be hoped that some local geologist, who is situated so as to note all the elements that should be considered, will obtain the data required for a calculation as to the age of Ausable Chasm.

Wood Finish.

Richness of effect may be gained in decorative woodwork by using woods of different tone, such as amaranth and amboyna, by inlaying and veneering. The Hungarian ash and French walnut afford excellent veneers, especially the burls or gnarls. A few useful notes on the subject are given by a recent American authority. In varnishing, the varnishes used can be toned down to match the wood, or be made to darken it, by the addition of coloring matters. The patented preparations known as "wood fillers" are prepared in different colors for the purpose of preparing the surface of wood previous to the varnishing. They fill up the pores of the wood, rendering the surface hard and smooth. For polishing mahogany, walnut, etc., the following is recommended: Dissolve beeswax by heat in spirits of turpentine until the mixture becomes viscid; then apply by a clean cloth, and rub thoroughly with a flannel or cloth. A common mode of polishing mahogany is by rubbing it first with linseed oil and then by a cloth dipped in very fine brickdust; a good gloss may also be produced by rubbing with linseed oil, and then holding trimmings or shavings of the same material against the work in the lathe. Glass paper, followed by rubbing, also gives a good luster.

There are various means of toning or darkening woods for decorative effect—logwood, lime, brown soft soap, dyed oil, sulphate of iron, nitrate of silver exposed to sun's rays, carbonate of soda, bichromate and permanganate of potash, and other alkaline preparations are used for darkening the wood; the last three are specially recommended. The solution is applied by dissolving one ounce of the alkali in two gills of boiling water, diluted to the required tone. The surface is saturated with a sponge or flannel, and immediately dried with soft rags. The carbonate is used for dark woods. Oil tinged with rose madder may be applied to hard woods like birch, and a red oil is prepared from soaked alkanet root in linseed oil. The grain of yellow pine can be brought out by two or three coats of japan much diluted with turpentine, and afterward oiled and rubbed. To give mahogany the appearance of age, lime water used before oiling is a good plan. In staining wood, the best and most transparent effect is obtained by repeated light coats of the same. For oak stain, a strong solution of oxalic acid is employed; for mahogany, dilute nitrous acid. A primary coat, or a coat of wood-fillers, is advantageous. For mahogany stains the following are given: two ounces of dragon's blood dissolved in one quart of rectified spirits of wine, well shaken; or raw sienna in beer, with burnt sienna to give the required tone; for darker stains boil a half pound of madder and two ounces of logwood chips in one gallon of water, and brush the decoction while hot over the wood. When dry, paint with a solution of two ounces of potash in one quart of water. A solution of permanganate of potash forms a rapid and excellent brown stain.—*Building News.*