

Improved Self-Acting Gate.

The gate which the engravings illustrate has no springs or similar mechanical devices, but opens and closes simply by its own gravity. The main peculiarity is its method of hanging, not depending, from hinges placed in a vertical line, but from two points considerably removed from the vertical, in their relations one to the other. The foot is pivoted to a ring or staple fixed in the lower end of a post, and the top of the gate to the arm of an upright crank, as at A. This crank turns in staples secured to the post, the lower one a little out of the perpendicular. It will be seen that the lower gate hinge is at the back of the upright, and the upper at the front. The lower end of the upright crank has a horizontal foot, B, to which is pivoted two horizontal rods connected with two double right-angled cranks, C, one on each side of the gate. When one of these cranks is in a horizontal position the other is upright. The elevation or depression of one or the other partially rotates the upright crank at the gate post, elevates the forward or latch end of the gate, and throws the top of the hinge end of the gate at an angle toward the direction in which the gate will swing. This change of position changes the center of gravity, and the gate swings swiftly by its own weight to place, where it is held by a latch, shown enlarged in Fig. 2. This latch is without rivet, and closes by a simple flat spring, which having very little action and being concealed in the gate upright, is not liable to derangement. A diagonal brace extending from the lower front of the gate to the upper part of the rear upright serves, by means of nut and screw, to keep the gate in position if it should at any time tend to sag. In the engraving, for convenience of illustration, the lower hinge and the rods connecting it with the right-angled cranks are shown above the surface; but, in fact, they are below the ground, the rods being inclosed in gas pipe so that no water can reach them, and the lower pivot is guarded by a suitable casing of cast iron. The double cranks are operated by the wheels of a carriage or the pressure of the pedestrian's foot, and are placed at a sufficient distance from the gate to permit it to swing without interfering with the team.

An adaptation of the principle of the gate may be used, by which the gate is operated by means of handles or levers on posts connected to the operating crank by stout wires, the handles being touched by the rider in passing. Small hand gates, hung in the same manner, may be constructed to be opened by a latch in the ordinary way.

Patented July 9, 1867. All applications for rights, gates, etc., should be addressed to the American Gate Company, 225 Superior st., or box 2,156, Cleveland, Ohio.

Method of Locking the Nuts of Fish Plates.

Frequent jarring will rapidly loosen nuts however tightly they may be screwed up. Ordinary check or outside nuts are not proof against it under usual circumstances; but the jarring of the rails on a road over which frequent trains pass, is a harder trial than that of any ordinary machinery. Nuts holding the bolts of fish-plates on rails are continually requiring adjustment.

The improvement herewith illustrated provides blocks placed between the nuts which effectually prevent them from turning. The letters, A, represent the adjacent ends of two contiguous rails, held in place by the fish plates, B. These are secured on the sides of the rails, by bolts, C, which pass through them and the web of the rails, and are held by the nuts, D. Blocks, E, of wood or other suitable material, are made of suitable size and shape to fit into the space between the opposite sides of the two adjacent nuts to be locked. The block or locking piece is held in place by a rivet headed screw or nail, F, which may pass through the fish-plate its head being between the fish-plate and the rail, and should have a small nut screw on its outer end, which end should then be slightly riveted down on the nut. In case old fish-plates are used, a plate, G, of wrought or cast iron may be placed on the outside of the fish-plate, through which the bolts, C, and the screws, F, pass, the head of the screw being between the plate, G, and the outer side of the fish-plate. These explanations may be readily understood by reference to the sections, Figs. 2 and 3.

Patented through the Scientific American Patent Agency, July 7, 1868, by Samuel Garber, who may be addressed at Greenville, Mercer County, Pa. [See advertisement on back page.]

PERSEVERANCE ONE GREAT ELEMENT OF SUCCESS.

It may be doubted if the statement, too commonly accepted as truth, that "success is the real evidence of ability" is

just; yet it must be conceded that, generally, success attends well-directed and persistent endeavor, and that the qualities of discretion, prudence, and perseverance are proofs of ability in their possessor. That a "rolling stone gathers no moss" is correct in fact, and the sentiment, properly applied, is also true. Not only does human experience in these days teach the necessity of "sticking to one's business," the fact that vacillation and irresolution, and want of perseverance are ruinous to success, but the Scriptures teach the same truth. Jacob said of Reuben: "Unstable as water, thou shalt not excel." St. Paul said: "To them who by patient continuance in well-doing, seek for glory, and honor, and immortality—God will render—eternal life." If a young man has decided upon the business he intends to follow through life and serves



NICHOLSON'S PATENT AUTOMATIC GATE.

an apprenticeship to it, he should consider carefully before he allows a brilliant offer to embark in some other business to move him. His road to success lies through the routine of his chosen business. Life is too short, even in this fast age and this fast country, for a man to attain eminence or even success in two or more branches of business. Exceptions there are, of course, but they only prove, from the prominence given them in the public prints, that they are exceptional. The case is very well stated in the following, cut from an exchange. Many who have been close observers of life can recall instances similar in kind if not degree:

"I am writing a play," said an intimate friend to us one day years ago. "I'd like you to hear it, you have had some experience in literary matters." We found the play in an unfinished condition, but so far as it was in a form to be heard, it was very interesting and sufficiently witty. Its writer had undoubted talent.

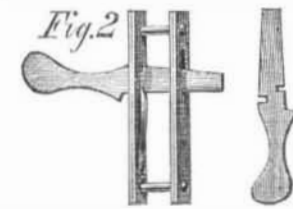
"How comes on the play?" we asked as we met our friend, four weeks from that time. "Pretty well; but, by the way, come around to my room this afternoon; I have a plan to talk over." The play was not brought out that afternoon. Its writer talked medicine to us an hour or two. He had learned of a remarkable root, grown in the East Indies and very scarce, but a certain cure for rheumatism and consumption, scarlet fever and sore throat. One man in England, an M. D., had introduced it there. He knew its secret, and would probably sell it to him at a low figure. He intended to start for England directly.

"When do you go away?" we asked, not many weeks after this. "Away? Where?" "To England." "Oh—yes—I'm not going just now—by the way—I've got a plan. When I was in Cuba I saw how this sugar business was conducted—do you know there are immense profits in it? I have a friend who sails between here and the Island. I'm going to get him to buy some

spite of the many obstacles to be overcome. The nature of these may be estimated from the fact that the cutting is not only very deep, but also so narrow that that the space between the sides and the cars, when passing, does not exceed twenty inches. This stone has been widened so as to erect masonry. The widening is done by small blasts, in order that no great mass of rock may be thrown on the track, and thus delay the constantly passing trains. A portion of the space excavated is used for building the walls, while the arch is constructed of five layers of brick placed side by side. Shafts will be placed at intervals for ventilation and the escape of smoke. These will rise ten feet above the grade of Fourth avenue, and have a light iron cover to prevent anything falling through. On account of the want of space below, all the stone blasted out has to be hoisted up by derricks to the level of the street, cut into shape, and then lowered when needed in the erection of the wall. About 830 linear feet of mason work has already been completed, leaving 270 feet more to be built. The total length will be 1,600 feet, including the solid rock section between Ninety-second and Ninety-fourth streets. This last will be the most difficult portion of the whole, as the work will all have to be done from below with scarcely any means for removing the debris.—Sun.

The Chemistry of Sunstroke.

The effects and the treatment of sunstroke are well understood in this country, where the malady is one of frequent occurrence—more frequent, probably, in the hottest months, than in any other parts of the world. But the cause of the



sunstroke is as yet a mystery. The intense heat (merely as heat) of the solar rays, is not the agent of mischief. The human body may be exposed to the Turkish bath of 140°, and remain in it for an hour without injury. This is a much higher range of heat than that of the atmos-

phere at which sunstroke often occurs, viz.: from 100° to 110° (in the sun). Men working in zinc furnaces or iron foundries are subjected to a heat above 120°, but they are not prostrated to the ground with the phenomena of the sunstroke. The human organization is fitted to endure a much higher pitch of heat than any we have named. Experiments are recorded of men sitting quite comfortable in ovens while chickens were slowly browning by their side. How does it happen, then, that at a temperature of the open air, comparatively so low, men melt away (as the popular saying is) with heat?

A writer in the *Journal of Commerce* says, the reason must be looked for in the character of the sun's rays. The heat of the sun differs from every other heat, as the light of the sun differs from every other kind of light. This is a fact so well known as to need no demonstration. The effect of the sun's heat upon plants—as contrasted with artificial heat—is the most familiar, and, perhaps, the most striking illustration at hand. All animate and inanimate things are subject to precisely the same great laws of nature; and the solar heat which makes the flowers droop and close their petals, as if to shut out the dazzling rays, is not without its marvelous chemical effect upon the sensitive brain of man. The effect, we say, is chemical—just like the effect of poison. Strychnine, cyanide of potassium, arsenic, morphine, and the other deadly drugs do not work more marked organic changes in the system than a sunstroke. The countenance of the victim is dark-clouded and injected with blood, and a *post mortem* examination discloses congestion of the brain, lungs, and heart. These are the effects, varying in degree, of the administration of poisons. The chances of recovery from poisoning are far better, if remedies are seasonably applied, than from sunstroke. The latter is almost always fatal with persons of delicate health or full habit.

As to remedies, there is no improvement on the old ones. The application of ice to the head and under the armpits, brandy and water, or other stimulants, administered internally, a mustard plaster on the stomach, vigorous chafing of the body and especially the hands and feet, fanning, and plenty of air—these are restoratives efficacious where anything is of avail.

Bleaching and Granulating Sugars.

In No. 4, current volume, we illustrated on the first page a device for purifying and bleaching cane juice. Since then we have received some specimens of the sugar purified by that process which seem to be of very excellent quality, even inferior cane delivering superior juice which granulates easily and makes a good quality of sugar. The process is well worthy attention by those interested in the manufacture of sugar. The address of the inventor was incorrectly given in our description of the illustrations; it should have been Evan Skelly, Plaquemine, Iberville Parish, La.

TORONTO has produced a traction engine for drawing wagons over common roads, and it is said to work well. Brazil also puts in an appearance with a traction engine which runs easily on Macadamized roads, dragging a loaded omnibus up a steep hill with ease and speed, and the Emperor uses it for his country excursions from his summer palace at Petropolis.

Fig. 2

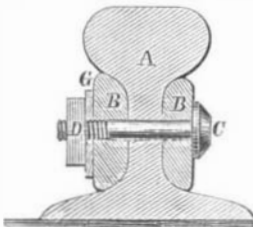


Fig. 1

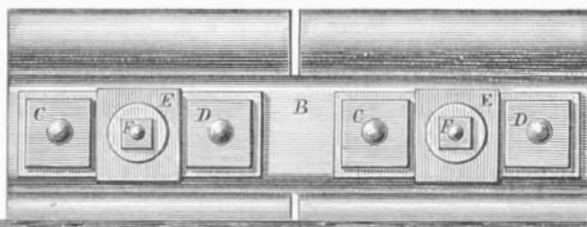
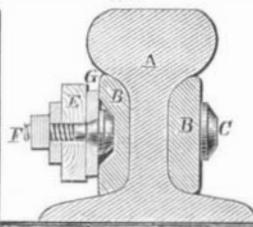


Fig. 3



GARBER'S PATENT LOCK-NUTS FOR RAILWAYS.

sugar for me, and I'll get a little corner store—live cheaply, you know—and in less than two years—"

We wished him success with his new plan and have not met him since. We received a letter from him, however, not many weeks ago. He was living in a little country town, where he had gone for his health, and was studying for the ministry. This reminded us of the fact that ten years ago he prepared himself for the ministry of another denomination. He actually went to Europe to finish his education, gave up the idea, returned to this country, and went into the navy. He afterward engaged in business pursuits for a few years, then took up literature; then came the various plans which we have noticed, and now a friend informs us that he had given up the ministry again, and is about to go on a farm and raise honey.

This reads like a fiction or a burlesque; every word of it is literally true, and the man to whom it refers will read this article. He has talents which are admitted by every friend he has ever had. He might find a name in literature. He would succeed in business; he would make an excellent minister. He is an exceedingly agreeable companion. His life, however, will be an absolute and total failure. It will be failure simply because he has no continuity of purpose. He cannot control his judgment and his taste. He tires of everything as soon as the novelty is lost.

An Engineering Feat.

Quite a remarkable piece of engineering is being accomplished on the Harlem Railroad at Yorkville. A substantial archway is being constructed, extending from Eighty-eighth to Ninety-second street, and covering an open space which has been the scene of several accidents, and is in itself exceedingly dangerous. The work was prescribed at the time of granting the charter to the road, and is now being completed in