Ruins of the Panama Canal.

A correspondent of *Engineering News* reports as follows:

The bulk of our observations were made from the rear platform of a rapidly moving train; but the facts were had from Mr. Lefevre, the general agent of the Pacific Mail Steamship Company, a man who has spent years upon the Isthmus and was familiar with every foot of the way.

The first signs of the artistic work and extravagance of the French canal builders were met with in coming into Panama Bay, past the famous Sanitarium of Toboga. There a city of hospitals has been built, with bright red-tiled roofs and massive retaining walls peeping out of park-like grounds threaded with walks and drives for the director-general and his subordinates. A costly roadway connects this sanitarium with Panama. As the latter city is approached, another hospital, or a mass of hospital buildings, looms in sight, situated on the high ground back of the town, and built and adorned even more elaborately than those at Toboga. By an oversight of the engineers they were planned and constructed before any arrangement had been made for carrying the sewage through the city of Panama, which lies between the hospitals and the bay. When this time came, the citizens, who seem to believe in keeping their own sewage within the city limits, grew virtuously indignant at the proposition of the hospital authorities to carry the sewage through the town; and they had goodly reason. The tide at Panama is over 20 feet, and when this goes out it leaves exposed broad flats of mud that now cry out to the high heavens in their foulness.

Almost immediately upon leaving the city on the Panama Railroad you come in sight of the canal works. The towers of Belgian and French dredges appear above the trees in now detached and partly filled-up channels that were once sections of the sea level canal. A little further east, and you come to an almost continuous line of villages for laborers that were never occupied, storehouses, sidings filled literally with miles of dump cars, locomotives, and other machinery, past stacks of Decauville railway track and the small iron dump cars to fit them, and the endless variety of material that went to make up the plant of the most extravagantly equipped public work the world ever saw. Near Tavernilla we saw a line of steam cranes, almost buried in the jungle, that we have undoubted authority for saying have occupied this same siding for years; they were never used. On another siding we saw about 60 clumsy locomotive boiler steam drilling machines, with the drill frames rigidly attached alongside the boiler. These too had been there for years, and had never been fired up, for the proper reason that they were utterly worthless for work on the Panama Canal.

All of the machinery in sight was well cared for, and outwardly looked well enough with black paint and white-leaded bright work. They had been put in this condition just previous to the visit of the last French commission, and it is said that $20,000 per month is now being spent in keeping them in a presentable shape. Yet a mechanical engineer, who examined some of this machinery with a view of possible purchase, informed us that when he attempted to open the doors to look into a boiler, these fell off, a thin shell of rust covered with paint. Inside, the boiler was so scaled with rust that he thought that a good blow with the fist would have punched a hole through the plates almost anywhere. When Mr. Lefevre was asked why this plant was not gathered up and shipped out of this moist, iron-destroying climate, the reply was that we evidently knew little of Panama Railway freight rates. The transportation charges would have eaten up all the profits, even if the machinery were bought at old-iron prices.

The buildings along the line of the canal number thousands, though comparatively few seem to have been occupied. These houses are constructed of wood, with corrugated iron roofs; but cheap as some of them looked otherwise, they were generally propped up on pillars of stone masonry laid in cement mortar, that cost more money at times than the building they supported.

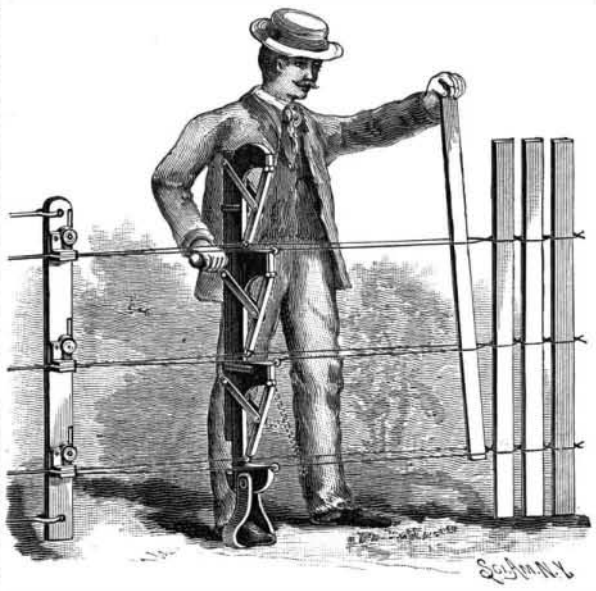
On the line of the canal a large amount of work has undoubtedly been done, and some of the cuts are deep and wide and the spoil banks are high. But it is just as evident that an immense amount of work yet remains to be done before even a lock canal can be built.

Parts of the canal once excavated at great cost are almost completely filled up again, and in other places the banks have washed in and the channel is obstructed. Nearer Colon, channels that once admitted vessels of 14 feet draught 14 or 15 miles inland are so blocked up in places that a canoe alone could navigate them. On the eastern or swampy side there appears to be a quagmire of unknown depth, and it is little wonder that the deposit from the conveyer pipes of the dredges forced up the soil in the line of the canal being excavated.

FOR a good recipe that will stick muslin to bunting, boil together 2 parts shellac, 1 part borax, and 16 parts of water. The surface must not be greasy.

A LIGHT AND SIMPLE FENCE MACHINE.

An easily operated device, patented by Mr. E. S. Lafferty, by which fence wires are quickly crossed after the insertion of each picket, the wires being, at the same time, held under proper tension, is represented in the accompanying illustration. A movable post has at its lower end a stirrup, for convenience in holding the post in proper position, and at the outer edges of lugs or projections, one above another, at one side of the post, are eyes, through each of which passes one of each set of wires for holding the pickets in position, the other wire of each set passing through corresponding eyes on levers fulcrumed to the lugs. The levers are adapted to swing transversely across the fixed eyes



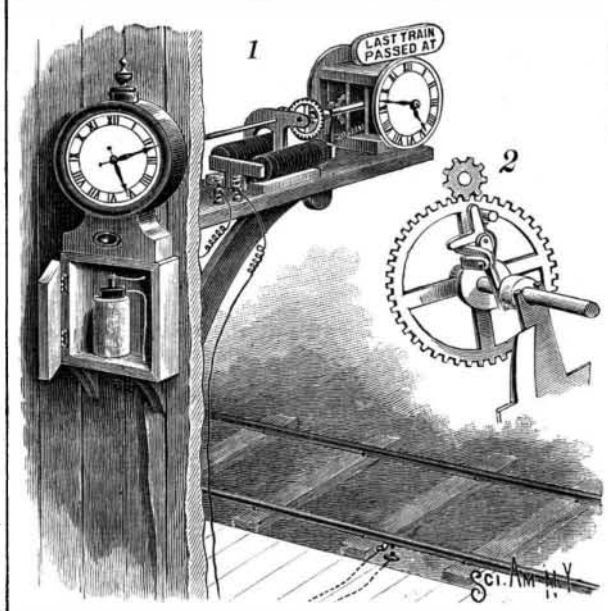
LAFFERTY'S MACHINE TO WIRE FENCE PICKETS.

on the lugs of the post, the wires carried by the levers being thus moved alternately from one side to the opposite side of the other wires. Each of the levers is pivotally connected by a link with a bar having a handle and sliding vertically in keepers on the front side of the post. A stop limits the downward movement of the bar and the outward swing of the levers, the inward motion of the latter being limited by the eyes striking against the edge of the post. To hold the several sets of wires at a proper tension, they are passed from the reels through tension devices held on a board connected by ropes with a post or other fixed support. The tension device has a fixed lower jaw, on which presses a movable jaw actuated by a cam fulcrumed on a stud projecting from the back plate of the device, a suitable handle being provided for operating the cam.

Further information relative to this invention may be obtained of Mr. L. H. Slagle, East Brady, Pa.

A RAILWAY TRAIN TIME REGISTER.

A register which shows positively to the engineer of an approaching train the exact time at which the preceding train passed over the track is herewith illustrated. It has been patented by Messrs. Joshua C. Dickover and Walter Scott, of Hot Springs, South Dakota.



DICKOVER & SCOTT'S RAILWAY TIME SIGNAL.

The minute hand arbor of the clock within the station projects through the back of the clock case, and to it is attached one end of a spindle which carries at its opposite end a pinion engaging a spur wheel of a mechanism for connecting the time movement with a spring-actuated dial mechanism at the side of the track. This mechanism is in a double frame exposing opposite clock dials, and minute hand arbors in the frame impart motion to the hour hands through dial wheels in the usual way. These arbors have crown pinions engaged by a spur wheel on an arbor of the connecting mechanism, and one of the crown pinions is engaged by a spur wheel on a mainspring arbor to which is attached one end of a clock spring, the other end being attached to the frame. A stud projects from the spur wheel of the connecting mechanism, shown in Fig. 2, and upon its arbor is an angled arm to which is pivoted a right-angled lever, a sleeve mounted on the arbor being in the path of the longer arm of the lever. Beneath this mechanism, on the base of the instrument, is mounted an electro-magnet, the armature lever of which is divided into two arms, one of which engages the sleeve on the arbor while the other engages a toothed wheel of the dial mechanism, a retractile spring attached to the armature lever and to the frame normally holding the lever away from the magnet. Under one of the track rails is placed a bow spring carrying a contact point electrically connected through a battery cell with one terminal of the magnet, and below the movable contact point of the spring is a stationary contact point electrically connected with the other terminal of the magnet. On the passing of a train the spring beneath the track rail is depressed, bringing the contact points together and closing the circuit with the magnet, when the latter attracts the two-armed armature lever, whereby the sleeve is moved on the arbor of the connecting mechanism and a toothed wheel of the spring-actuated dial mechanism is released, whereby the hands on the dials are carried forward to indicate the time shown by the clock at the moment the contact points touch. When the train has passed the circuit is broken, the retractile spring then withdrawing the armature lever, and the indicating mechanism remains quiet, but the spur wheel of the connecting mechanism is constantly carried forward by the clock, the stud on this wheel limiting the movement of the indicating mechanism when the latter is again started by the passing of a following train.

The Chemistry of the Ocean.

The study of the 685 densities of the water of the sea made during the expedition of the Challenger, and the report of 108 series, of which each extended from the bottom of the ocean to the surface, the discussion of the results of the deep soundings obtained by Pola in 1890, the various theories relative to the chalk formations by chemical action, with the necessary intervention of living creatures, and, finally, the different observations of oceanic analysis with which M. J. Thoulet has been occupied for several years past, relative to the existence at the bottom of the ocean of two belts of water, one in repose, and the other in motion, are all in accordance with the following hypothesis:

The surface of the ocean, submitted to climacteric changes, is in a state of heating and evaporation more or less intense. The variations which result in the real density and in the chemical composition of the waters, joined to the mechanical action exercised by the wind, give in the place of horizontal marine currents those more or less vertical, which cross between these where they overlie each other, with extreme quickness and in different directions. These together constitute oceanic circulation, which is effected almost entirely in a very shallow belt, about 500 fathoms in depth. The substances, only slightly soluble, contained in the waters of the seas, and brought to the ocean by the fresh waters which are far more dissolvent, attain at a certain depth their limit of solubility and form precipitates. Becoming solid, they descend vertically, penetrate into the still belt, and at last reach the soil at the bottom. Surrounded by immovable water, they dissolve and increase the proportion of salt contained in the deepest stratum of the water, and that immediately in contact with the soil. They then spread, and with extreme slowness, increase the saline quality of the adjacent waters, and at the same time extend to the stratum next to the soil which is not saturated, and consequently continues to dissolve the new material which arrives without cessation. The submarine soil is then a kind of center of chemical activity, fed by fresh material from the surface, and radiating slowly toward the surface.—*Public Opinion, Revue Scientifique.*

American Exhibitors at the International Electrical Exhibition at Frankfort-on-the-Main, Germany.

The United States are represented at the Frankfort Electrical Exhibition by a number of leading firms. The Thomson-Houston Company, Lynn, Mass., exhibits its dynamos, electromotors, and mining machines. The Edison Company, on account of having transferred its patents to the Berliner Allgemeine Elektrizitats Company, is not directly represented, but through the last mentioned firm. The phonograph is shown by the Edsion United Phonograph Company, of New York. The Westinghouse Company exhibits its well known steam engines, and another type of American engines is shown by the one belonging to the Thomson-Houston Company, and manufactured by McIntosh, Seymour & Co., Auburn, N. Y. Instruments are represented by the Weston Electrical Company, New York, and electrical elevators by the American Otis Elevator Company, New York.