Correspondence.

An Inventors' Congress.

To the Editor of the Scientific American:

The magnitude of the interests involved in our governmental patent system demands protection and the fostering care of the nation.

It extends to the whole field of our great and rapidly expanding industries—agricultural, commercial, manufacturing, mechanical, mining, chemical and mechanical philosophy, and the broad range of the scientific developments of the world's industries.

It calls in trumpet tones upon the host of toiling inventors to rally and to concentrate their mental force for the equitable protection of their rights.

It has become, apparently, expedient to convene an *Inventors' Congress*, at Washington or New York, on or about the 15th day of November next, to take such action as may be deemed advisable, in anticipation of the meeting of the national Congress.

Among the questions for consideration by the *Inventors' Congress*, the following may be entitled to some degree of prominence:

I. The reformation and equitable establishment of our patent system.

(1) The classification of patents in conformity with a stringent rule of discriminating charges, scaled according to relative importance and periods of continuance.

(2) Adjusting and limiting the revenues to the legitimate expenditures of the Patent Office.

The present accumulation of revenue on the operations of the inventive genius of citizens is abnormal to our doctrines and system of government, and oppressive to the indigent inventor.

(3) A competitive system of premiums for indicated or prescribed inventions of national importance, and also the bestowal of moderate "*bounties*" on deserving indigent inventors.

II. The expediency of petitioning the Federal Congress to convert the Patent Office into an executive department of the national government.

The vast arena for the emulation and development of the inventive genius of our citizens would find a more expanded scope under an independent autonomy.

III. The question may be thus summarily considered as to the expediency of *inviting the nationalities of the world* to participate in an *Inventors' Congress*, at Paris, London, or Washington, to deliberate on the adoption of a plan for co operation in the administration of the great interests involved in the field of invention.

In the trite adage that "*necessity is the mother of invention*," there is, doubtless, some truth, but it is *capital and not necessity* that profits by invention abroad, and very often at home!

The above noted interests involve a policy of national concern, inviting prompt consideration. About 243,000 inventions have authentic record, and have been already illustrated in the vast sphere of our national industries, imparting vigorous action evolved by inventive genius.

IV. The question is also presented as to the expediency of establishing a *stock exchange for patented inventions* at New York, as early as September ensuing, with branches at the great commercial centers at home and abroad, thus giving solvency to the productions of inventive genius among the world's industries.

V. It is respectfully suggested that inventors favoring these views organize in each State at the earliest practicable moment, and select delegates to an *Inventors' Congress*, to meet on the 15th day of November, 1881, on the *ratio of two at large and one for each five hundred inventors for each State represented.*

It is also suggested that the SCIENTIFIC AMERICAN—the publishers consenting—be made the organ for communication for the development of this subject.

DANIEL RUGGLES.

Fredericksburg, Va., June 25, 1881.

Comments on Letter of Mr. Daniel Ruggles.

For nearly forty years the SCIENTIFIC AMERICAN has been an earnest advocate of inventors and inventors' rights. On every proper occasion it has set forth the just claims of inventors to popular appreciation, public honor, and that pecuniary reward which is secured by the legal recognition of their property rights under letters patent. If, therefore it fails to sympathize with the movement which Mr. Ruggles proposes, its readers will understand that it is not for any lack of desire to advance in the fullest degree the lawful interests of the pioneers of material progress.

With all respect to our correspondent's judgment, we are compelled to take issue with the very first proposition he lays down, inasmuch as it implies that the interests of inventors have not hitherto enjoyed the "protection and fostering care of the nation."

The Patent Office has not always been administered as wisely as might be desired; our present legislation has been more or less defective from the first; our courts have not always been free from prejudice and error in adjudicating patent cases; nevertheless, our patent interests are and always have been under the fostering care and protection of the nation to a degree not attained or even aimed at in any other country. There is room for improvement, as there is in the administration of all human affairs; but that improvement is not likely to be furthered by denying to the nation the credit which is justly its due for its not unsuccessful efforts to encourage inventors and protect the rights of patentees.

The expediency of calling a convention of inventors, national or international, may safely be left to the decision of the vast and honorable body of men and women deserving the name. The probability of such a convention's accomplishing much, even if held, is, to say the most, very slight. Certainly Mr. Ruggles' call to reform the patent system, without a more specific indication of what is to be changed, and in what way, and for what purpose, is not likely to be responded to with any great enthusiasm, except, perhaps, by certain associations, whose interest in the "amendment" (so-called) of the patent laws has thus far boded little good to inventors.

This is not the first time that a general convention of inventors has been proposed. That such propositions have never been put into execution is not surprising when we stop to consider how narrow is the basis of common interest on which inventors and patentees can come together, calling to mind at the same time the circumstance that the troubles of inventors arise quite as often from the opposition of other inventors as from that of the public at large.

As citizens it is easy for A, B, and C to unite in all heartiness in agreeing that the public good demands the fullest encouragement of invention. As inventors representing the three tenses of the verb "to invent"—past, present, and future—it is as easy for them to find themselves in an attitude of mutual hostility. A's invention is finished, patented, introduced, and is the basis of a profitable industry. What A specially wants of the patent laws is that they should protect his monopoly, make its duration as long as possible, and not encourage overmuch the efforts of B and C to supplant him. B's invention is before the Patent Office for recognition. He has a horror of grasping monopolies. He feels it a moral duty to protect the public from the extortions of A. He would, therefore, have A's patent construed most rigorously, and the utmost latitude allowed to his own claims. If A or any other inventor has forestalled him in any particular he regards it as somehow a personal wrong, and is apt to blame the patent laws for discouraging invention or accuse the patent examiner of working in the interest of some "bloated monopolist." C is an inventor in the future tense. He wants to accomplish a certain end, and is provoked to find that A and B and possibly others have patented the very devices he wants to use. The interests which he has in common with them are apt to be overshadowed by those interests which conflict, certainly if he is at all inclined to be selfish.

In times past, when novel inventions were few, the inertia of popular habit and popular prejudice was the chief hinderance to the immediate success of new inventions. Now, improvement, progress, or whatever it may be called, is the rage; novelty is grasped at and fought over, and too often the inventor's worst opponents are those of the household of invention—his brother craftsmen.

It may be that a union of inventors would bring peace by arbitration; but we are inclined to think that such a union would have to be the product of much fighting.

The special ends which Mr. Ruggles would have the proposed convention work for do not, as a whole, impress us as altogether feasible or desirable. If the charges for letters patent were to be graded, as he proposes, according to the importance of the devices covered, there would at once arise the impossible task of deciding the relative merits of inventions. The natural tendency of inventors is to exaggerate the value of their inventions; the tendency of the officials of the Patent Office is the reverse; and it often happens that both fail to appreciate the real significance of particular inventions, the working value of which may not become fully apparent until years after the patent is granted. On the other hand, inventions which seem to be, and really are, of signal value when made, may be supplanted by better devices almost immediately, and so lapse into insignificance. Only omniscience and infinite impartiality in the Patent Office could keep the proposed discrimination from being an instrument of injustice to inventors and the source of immediate dissatisfaction to all. The suggested system of premiums and bounties to indigent inventors would be as impossible to carry out fairly, as it would be certain to open the door to corruption and scandal. Besides, the same determined effort which would secure to the deserving inventor financial assistance from a government office, would be much more likely to obtain the needed help at the hands of clear-sighted or speculative individuals. With our abundance of capital seeking opportunity for investment a promising invention need not suffer for lack of means for its development.

The proposition touching the establishment of a stock exchange for patented inventions is, in its present form, simply incomprehensible. The development of properties is in no way furthered by stock exchange operations, nor is their solvency; and we fail utterly to see how inventors could be benefited by the institution suggested—barring, of course, those of the Keely and Gamgee sort.

The propriety of adjusting the revenues of the Patent Office to its legitimate expenditures has been repeatedly urged by the SCIENTIFIC AMERICAN. On this point our agreement with Mr. Ruggles is complete.

We should be glad to see an international convention looking to a unification of the patent laws of all nations on the basis of the American system; but we see little reason to anticipate such progress on the part of foreign governments for many long years.

Rye Roots in Ice.

To the Editor of the Scientific American:

I send you a vegetable growth that I think possesses some botanical interest as an illustration of the anomalous conditions under which certain forms of vegetation can germinate and grow. These are the facts: Two years since Mr. John Gruel, a prominent confectioner of this place, called my attention to the fact that rye grains germinated and threw out long rootlets embedded in ice in his icehouse. At the time I saw a number of the grains with rootlets attached that were reported as growing in the solid ice. I did not doubt his word, but as I did not see the grains *in situ* I passed it by. Last year he did not use rye straw as a lining to his icehouse, hence there was not a recurrence of the anomaly. Last winter he again used rye straw to line his house, and last night he notified me that on removing ice he found a number of the sprouted grains. He told me I should be present to-day when he removed the ice. I was, and was witness of the following details: On removing a thick bed of ice from the wall, between which and the ice there was a packing of rye straw, I found a large number of the grains with their rootlets penetrating the solid, clear ice in various directions. The one I inclose I detached from a large lump of ice, the rootlets twining through the detached ice. The grain was contained in an ellipsoidal cavity of three-eighths inch major axis sunk in the smooth face of the ice resting against the wall. The plumule (I take it to be) ascended along a slight cavity, a prolongation of the receptacle of the grain. From the grain the rootlets spread out through the transparent ice, their track being plainly visible through the ice. Though following devious tracks, what was strange to me, the rootlets were drawn from the ice by a slight pull on the grain, as if they were not rigidly embedded in the ice.

At the same time I saw a number of similar instances, some with a greater number of rootlets and longer, but they were injured in extraction.

D. J. BENNER.

Gettysburg, Pa., June 16, 1881.

Ants as Fruit Growers' Friends.

Many of the leading orchard proprietors in Northern Italy and Soutbern Germany are cultivators of the common black ant, which insect they hold in high esteem as the fruit grower's best friend. They establish ant hills in their orchards, and leave the police service of their fruit trees entirely to the tiny colonists, which pass all their time in climbing up the stems of the fruit trees, cleansing their boughs and leaves of malefactors, mature as well as embryotic, and descending laden with spoils to the ground, when they comfortably consume or prudently store away their booty. They never meddle with sound fruit, but only invade such apples, pears, and plums as have already been penetrated by the canker, which they remorselessly pursue to its fastnesses within the very heart of the fruit Nowhere are apple and pear trees so free from blight and destructive insects as in the immediate neighborhood of a large ant hill five or six years old. The favorite food of ants would appear to be the larvæ and pupæ of those creatures which spend the whole of their brief existence in devouring the tender shoots and juvenile leaves of fruit trees.—*Prairie Farmer.*

Harrison's Moon Pictures.

We have examined with great pleasure the lithographic copy in color of Mr. Henry Harrison's painting of the crescent moon, just published. It represents the moon the third day from new, with the terminator at Messier. In the earth shine on the shadowed surface several of the more prominent features of the moon are visible. The picture, 24 inches square, shows the moon 18 inches in diameter; the background is dark blue, the color of the field in the telescope an hour after sunset. The accuracy of the work is attested by our best astronomers and students of the moon, and its value to students and institutions of learning is unquestionable. The entire surface of the moon will be similarly represented in a series of six pictures, showing the moon at three days old, at five days old, at seven days old or first quarter, at last quarter, sunset at Copernicus; and the last three days of the old moon, sunset at Aristarchus. Each plate is accompanied with an outline drawing and a descriptive pamphlet. The price is $3 a plate; to be had of Henry Harrison, New York.

Fresh Water Sponges.

Mr. Potts, of the Philadelphia Academy of Natural Sciences, states that the order *Spongidæ* has many more representatives in our fresh waters than has generally been supposed. He recently described before the academy three species of *Spongilla*, which he detected in a small stream near Philadelphia. Since then he has found the *Spongilla fragilis* of Leidy plentifully in the Schuylkill below the dam, and a lacustrine form above the dam, and has obtained a very slender green species, which appears creeping along stems of *Sphagnum*, etc., in a swamp near Absecum, New Jersey, a beautiful species from the Adirondack lakes, another lacustrine form from the lake near the Catskill Mountain House, and four species from an old cellar at Lehigh Gap, Pennsylvania.

Burroughs Price Brunner.

Mr. Burroughs Price Brunner, who died in San Francisco, June 4, at the age of 52, was an engineer and inventor of some note. When but a youth he invented a linseed oil press which is still in use and substantially unimproved. Before the war he was for twelve years superintendent and engineer of the Charleston, S. C., Gas Works. Losing his property in the South he made his home in San Francisco in 1864. He constructed the gas works in King street in that city; planned and constructed the Pacific Rolling Mills —an institution which now gives employment to from 400 to 500 men—and invented a great deal of the machinery used in it, notably that employed in utilizing old steel rails. He also planned and built the Pacific Oil and Lead Works, and the construction of the Virginia City and Truckee Railroad as a steam road was largely due to his influence. At the time of his death he was superintendent of the Gas Works, Rolling Mills, and Pacific Oil and Lead Works.

IMPROVED HOISTING APPARATUS.

We give an engraving of an improved apparatus for lifting variable loads which is both safe and portable. The invention consists in a block provided with differential gearing of novel construction, provided with a safety-stop device and automatic brake acting by the weight of the load.

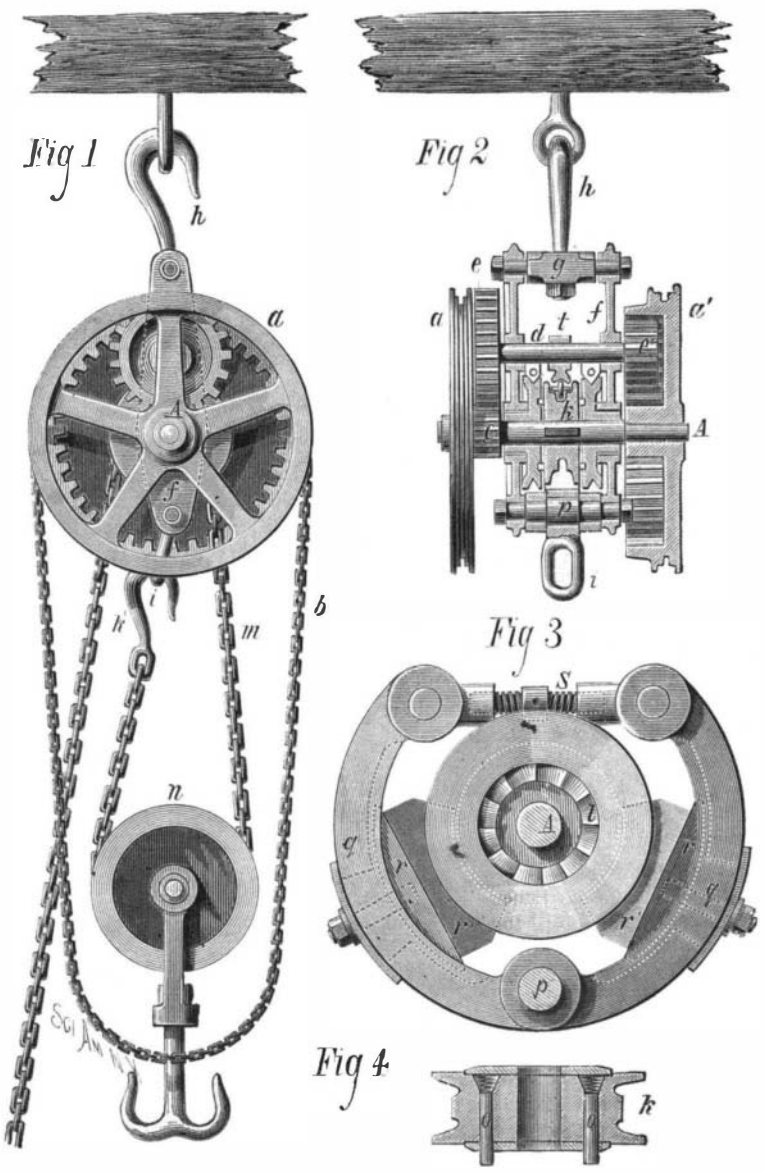
In the engraving Fig. 1 is a side elevation of the apparatus; Fig. 2 is a central vertical section; Fig. 3 is a vertical section showing the brake mechanism, and Fig. 4 is a detail view of the chain wheel.

A is the main shaft of the mechanism, having at its ends chain wheels, *a a'*, on which are endless hand chains, *b b*. The wheel, *a*, is loose on the shaft, and has on its hub a pinion, *c*. The wheel, *a'*, which is fast on the shaft, is formed with a rim flange and internal gear. *d* is a secondary shaft carrying fast pinions, *e e'*, that mesh with pinions, *c*, and wheel, *a'*, respectively. The shafts, A *d*, are journaled in cheek plates, *f f*, which at the upper end are connected by a yoke or bar, *g*, that is fitted with a hook, *h*, for suspension of the apparatus. At the lower end, the cheek plates, *f*, are connected by a bar, *p*, on which is hung an eye-piece or ring, *i*. On the shaft, A, between the plates, *f*, a chain wheel, *k*, is keyed, on opposite sides of which there are two wheels, loose on the shaft, having their hubs extended through the plates, *f*. On the shaft, *d*, is loosely hung a bent guide piece, *t*, that laps over the chain wheel and prevents the chain from rising. The hoisting chain, *m*, passes around the wheel, *k*, and its end having the hook, *k'*, may be attached to the load, or when double power is required the chain carries the block, *n*, and has its end connected to the ring, *i*. The brake wheels, *l*, have their faces next to wheel, *k*, formed with ratchet teeth, and the wheel, *k*, is provided with four spring pawls, *o*, two on each side, consisting of straight pins set in mortises, with spiral springs behind them, so that they are projected and engage the ratchets. The rims of the wheels, *l*, are formed with V-grooves.

There are two curved toggle bars, *q q* (Fig. 3), hung on the lower crossbar, *p*, beneath each wheel, *l*, and extending around them at opposite sides. The upper ends of each pair of bars are connected by a right-and-left-hand screw rod, *s*, to allow of their adjustment, and the bars carry brake blocks entering the grooves of the disk, *l*. The brake blocks are in two portions—the outer portions, *r*, that are attached to bars, *q*, by bolts passing through slots, as shown in Fig. 2, and the loose V-shaped portions, *r'*, placed between the portions, *r*, and brake wheels, *l*. The adjustments of these parts may be made so that the brake blocks shall give exactly the pressure required to hold the load suspended from the shaft, A.

The load is raised or lowered by operation of either hand chain, according to the power required. The chain on the wheel, *a'*, gives the greater speed, and with heavy loads may be first used to tighten the hoisting chain and the other hand chain then used. As the chain wheel, *k*, turns in raising the load, its pawls engage the ratchets of wheels, *l*. The load on shaft, A, is sustained by brake wheels, *l*, resting on blocks, *r'*, which, in turn, are supported by bar, *p*, so that the brake is continuously applied and the chain wheels arrested by the ratchet devices the moment the hand chains are left free. In lowering the load the hand chains are to be run backward, and the chain wheel, *k*, will then give revolution to the wheels, *l*. The load will thus be at all times under the control of the operator.

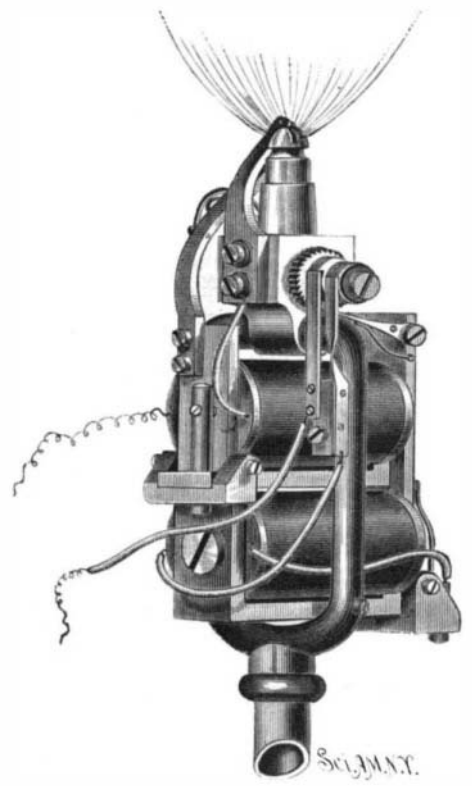
It will be seen that with this apparatus four rates of speed are attainable. The apparatus is also safe and portable, and can be made of comparatively small size and used for heavy loads. The brake wheels have sufficient holding power, though made of small size, for the reason that the whole load resting on the axle is taken by the brake blocks at opposite sides of the wheels. The resistance can be varied by shifting the blocks to change the angle of resistance. This invention was recently patented by Mr. George Speidel, 933 Buttonwood street, Reading, Pa.



SPEIDEL'S HOISTING APPARATUS.

LIGHTING GAS BY ELECTRICITY.

Undoubtedly the quickest, safest, and cleanest method of lighting gas is by means of electricity; but before the invention of the electric lighter shown in the engraving, attempts to make a lighter which could be used to light either a single light or a large number of burners did not prove altogether satisfactory. Two electro-magnets are connected with a cock and with ratchet wheels and circuit springs, arranged in such a way that one circuit and magnet turn the cock around until it is open, and the spark is produced at the same time to light the gas. The ratchet wheel has blank spaces, so that after the gas is fully on the cock cannot be turned any farther by that electric circuit, no matter how many times the spark-producing lever is operated. The second line-wire and magnet are employed for turning off the gas, and in so doing the other ratchet wheel is brought to the position where the first pawl can act upon it, when the same is moved by the first magnet in turning on the gas and lighting it. When the gas has been turned off, the circuit to the second magnet is broken, so that the further rotation of the cock is arrested.



RHODES' ELECTRIC APPARATUS FOR LIGHTING AND EXTINGUISHING GAS.

The upper magnet operates an armature lever carrying a pawl, which acts upon a mutilated ratchet wheel on the plug of the cock, and rotates the plug until a blank space in the wheel is reached, when the plug will not be turned further by the vibration of the armature; but each movement of the latter breaks the circuit at a point opposite the slit in the burner, and the spark of the extra current which passes at this point ignites the gas.

The vibration of the armature of the lower magnet closes the cock by a similar operation, and puts the ratchet wheel by which the cock is opened into position to be engaged by the pawl carried by the armature lever of the upper magnet. With this construction all that is necessary to be done is to gently press the button belonging to the particular burner to be lit, when the gas will be turned on and ignited instantly; by pressing another button the gas is extinguished.

The action of the device can be made entirely automatic, so that the opening of a door or window will turn on the light. Used in this way it forms an effective safeguard against the attacks of burglars.

In the sickroom or nursery, or wherever it is desirable to have a light occasionally through the night, this invention is very desirable; and it must be admitted that the device does away with great risks from fire, since no matches, tapers, or lighters are required.

For particulars, address the inventor, Mr. T. H. Rhodes, 638 Monroe street, Brooklyn, N. Y.

Behavior of Metals in Solidifying.

For some years it has been well known that water is not—as was formerly supposed—the only substance that expands in solidifying. The recent investigations of Nies and Winkelmann go to show that it is rather the rule than the exception for metals to expand in solidifying.

The fundamental experiment was putting the solid metal into the fused metal. In some cases the difference of density could be measured. They found then that tin in solidifying is increased in volume 0·7 per cent; zinc is increased 0 2 per cent; while solid bismuth is as much as 3 per cent less dense than the fused metal. The fact of expansion in solidifying was also demonstrated for antimony, iron, and copper. With lead and cadmium the results were indecisive; the former presented difficulties in the probably very small difference of density as a solid and as a liquid, its small heat conductivity and heat of fusion; the latter in the fact that in fusion it passes first into a viscous state. Thus, of the eight metals examined, six showed distinct expansion in solidifying, and the same may occur in the two others.

Cutting a Railroad along a Cliff.

The passengers on the Hudson River steamers have lately been entertained by the sight of gangs of workmen swarming along the face of a bold cliff jutting into the river near Cornwall, many of them suspended by ropes. A *Sun* reporter says:

The cliff was crowded with men, who, clinging like lizards to the face of the rock, were working seventy-five feet above the surface of the water; and here and there were laborers hanging (for the foothold they had obtained was hardly worthy of the name) by ropes fastened many feet above their heads, and circling their waists. All the passengers gazed with amazement at the singular spectacle; and when one of the men, turning toward the steamboat, waved his hand, cheered, and, falling off, swung for a moment, and then, getting his feet to their former place on the rock, renewed his work at cutting into its face, the spectators from the river sent back an answering cheer, as the boat swept around the point that hid the workmen from their sight, and left them discussing what they had just seen.

Greatly interested by the sight the reporter left the boat at Newburg and returned to Cornwall to inquire about the mid-air workers. He found that they were employed by the Ontario and Western Railroad Company, constructing the new North River Railroad. It is under contract to be completed by June 1, 1882, and is to run from Jersey City to Cornwall, and thence west to Middletown. The country through which it passes is so rocky and mountainous that much of the work has to be done by blasting, and this is especially the case between West Point and Cornwall. At West Point a tunnel 150 feet deep and 500 feet long has been cut through Target Hill, and many other bores, nearly as extensive, have been made. But the point already mentioned, near Cornwall, presented, perhaps, the greatest difficulties to the engineers and contractors. About eighty men are employed there, and they were selected on account of their activity and freedom from nervousness.

"They are not active enough, however," one of the surveyors said to the reporter, "to retain their foothold in every place, and at