when, during the succeeding minute, it ascended to 70 deg. and returned to 67 deg., where it remained two minutes. During the next succeeding minute it ascended to 72 deg., descended to 65 deg., and again ascended to 78 deg.

Remaining at 78 deg. two minutes, it commenced a descent occupying one minute, and remaining stationary at 38 deg. for thirty seconds, when it rapidly descended to zero, as if the current had been suddenly removed. Remaining at zero thirty seconds, another ascent was commenced east, reaching 50 deg. at one hour and sixteen minutes. During the succeeding minute the needle descended to zero, ascended three degrees, met and returned to zero. After remaining at zero one minute, an ascent west was commenced at one hour and eighteen minutes, reaching 34 deg. in thirty seconds. Remaining at 34 deg. one minute, it rapidly descended, as though the entire current had been suddenly removed. The needle then remained stationary at zero until one hour and twenty-six minutes, when it ascended five deg. east and remained between that and zero until one hour and thirty-three minutes, when it stood perfectly quiet at zero until one hour and forty minutes, at which time the observations were discontinued.

In order to give an idea of the comparative value of the auroral current during the above experiments, we would state that, with the same galvanometer, a battery with thirty-four cells in New York, with a resistance of No. 8 galvanized wire from New York to Boston, produces a deflection of 70 deg.—*Boston Journal, August 5.*

## A DAY AT THE NARROWS.

There is probably no spot on the face of the earth that has experienced a greater change since 1630 than the island and bay of New York.

"Then all the broad and boundless mainland lay
Cooled by the interminable wood; and where yon bright blue bay
Sends up his willing waves to kiss his decorated brim,
And cradles in his soft embrace the gay
Young group of grassy islands born of him,
And, crowding nigh or in the distance dim,
Lifts the white throng of sails, that bear or brmg
The commerce of the world, with tawny skin
And belt and beads in sunlight glistening,
The savage urged his skiff like wild bird on the wing."

There is probably no spot in the country where a more comprehensive idea may be obtained of the movement of the national industry than on this same bay. At 10 o'clock in the forenoon of August 5th, we stepped from Pier No. 4, North River, on board the *Naushon*, one of those white, fleet steamboats that give life to all American waters, and, fanned by the cool, delicious sea breeze, were borne swiftly southward through that busy scene which characterizes perpetually, day and night, without ceasing, the harbor of the commercial metropolis.

Immediately after leaving the wharf we passed through a fleet of naval vessels at anchor. A gentleman at our side pointed out the *Hartford*, the flagship of Admiral Farragut, the vessel of the most heroic achievements of any that floats upon the waters of this globe. Two years ago we saw her proudly steaming up through the Narrows, receiving and returning salutes from the forts and from the vessels of foreign navies, as she bore the old "Salamander" from the scene of his glory to the substantial rewards and the undying gratitude of the Republic. Then she was painted the lead color of the blockaders, but she is now glistening in a new coat of black, and presents the clean and trim appearance characteristic of men-of-war.

Not far from the *Hartford* was a French gunboat, with a curiously cut cap for her smoke-pipe, and otherwise loaded with ornaments. Near her was an American gunboat of about the same size, neat and snug like the Frenchman, but in her smooth, plain smoke pipe and entire absence of ornament, exhibiting that love of severe simplicity which marks the taste of American ship-builders—a taste that commands our highest admiration.

A little to the left, towards Governor's Island, was a large, dingy, dirty sailing ship, crowded with passengers, and bearing the English flag at the peak—manifestly an immigrant passenger ship from Liverpool.

A little further down the bay we met a large American propeller, also crowded with passengers, but these are men who are going to their homes. They are soldiers returning from their many marches and battles, and their final glorious triumph, to hearts that are yearning to welcome them, and to communities that will delight to do them honor, and which will transmit the memory of their services, with ever-increasing veneration and gratitude, from generation to generation.

On our swift way down the bay we pass several other steamers, besides large numbers of sloops, schooners, brigs, barks and ships, many of the sailing vessels in tow of those vigorous little screw tugs that are perpetually swarming all over the harbor. One of the steamers was a long iron ship propelled by a screw, crowded with immigrant passengers, and bearing a striped flag—we suppose of one of the German States. At the quarantine were a number of vessels with their flags in their shrouds, as a warning of their dangerous character.

After a run of seven miles we step on shore at Fort Hamilton. On the dock are five 15-inch guns, and a gang of men with a horse and windlass are slowly moving another up the sloping road towards its place in the battery. These are the last of the 31, the others being mounted on their iron carriages, each with its pile of 300 or 400 pound shells by its side. The 20-inch 1,000-pounder is also mounted on its iron carriage, and a pile of cast-iron globes, each weighing half a tun, are ready to be hurled through the sides of any hostile ship that may attempt to pass before its hollow throat. Across the Narrows, a mile away, is Fort Richmond, with its long lines of intrenchment, with the walls of the Water Battery glistening in white granite below, and the row of massive guns in Battery Hudson stretching away to the south. The old 64-pounders of this battery have been replaced by a large number of the heavy Rodman artillery, and, as we are looking, a flash rises from one of these, followed by the booming report and a great splash near a buoy in the water of the Lower Bay. The artillerists are evidently practicing to get the range of the new ordnance. After a few more shots some military officers near us remark that the distance is about two miles, and that the practice is very fine. We came to the conclusion that our warning given three years ago in regard to the light ordnance of the harbor forts is no longer needed, but that if the combined iron-clad fleets of England and France should attempt to force their way into this harbor, every vessel would be sent to the bottom.

Now, however, the scene is one of peaceful, though busy life. Far down towards Sandy Hook a long line of smoke is rising against the sky, showing that some bituminous-coal-burning steamer is coming in—doubtless a European steam ship just arriving from across the Atlantic. As far as the water can be seen from the neighborhood of New York City to the southeast horizon, it is studded with craft of various kinds—pilot boats with their huge figures painted on their sails, oyster sloops in large numbers, coastwise propellers of various sizes, white steamboats, and great ships—all coming and going perpetually—and they will doubtless continue to thus come and go through countless centuries.

The same swash and roar that here beats perpetually on the shore of Long Island is sounded along the coast from Cape Horn to Labrador. Beyond the south-eastern horizon stretches the Atlantic Ocean, a waste of waters, to the coast of Africa,

"At all times, calm or convulsed,
Icing the pole or in the torrid clime
Dark heaving, boundless, endless and sublime."

## RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

*Helix for Electro-magnets.*—The helices which are generally used with electro-magnets are made out of a number of strands of wire, which is covered with silk or some other non-conducting material, and which is wound very close on a cylinder or roller of wood or other suitable material, and such helices really answer every purpose. They are not produced, however, without the use of covered wire, which renders them very expensive, and all experiments which may have previously been made for the purpose of producing a helix of naked wire, have proved abortive for want of the proper precaution in placing the several strands. It is obvious that when naked wire is to be used for a helix, the strands have to be so arranged that each convolution of the coil is perfectly and completely separated from the adjoining convolutions, in order to compel the electric current to travel through the entire length of the wire from which the helix is formed, and, notwithstanding it may perhaps have been tried before to accomplish this object, it is certain that hitherto no helix made of naked wire has been successfully used, and that no helix has ever been made of naked wire having each strand or convolution completely and perfectly separated from the other. Such is the helix which forms the object of this invention, and which has the naked wire, constituting its coil, wound in such a manner that each convolution of the coil is separated from the convolution adjoining it, in a radial direction, by means of sheets of paper placed between it and the adjoining convolution, and in a longitudinal direction, or in a direction parallel to the axis of the helix, by winding the wire so as to leave a space between the convolutions sufficient to cause the electric current to pass through the entire length of the wire. Dr. L. Bradley, of Exchange Place, Jersey City, N. J., is the inventor.

*Gage for Quartering Cork.*—In the manufacture of cork stoppers the cork is first cut into strips of the requisite width and thickness for the size of cork desired, and these strips are again cut up into cubical pieces, each just large enough to make one stopper. This last-named operation of cutting up the strips of cork is technically termed "quartering" corks, and it is generally performed by hand with a large and sharp knife. During this operation it is necessary to have the end of the strip of cork bear against a gage which is in the proper position to correspond to the requisite size of corks. In this invention the gage is made adjustable in a longitudinal and in a transverse direction, and the plug, against which the end of the strip of cork bears, is made adjustable and yielding in such a manner that when the main part of the gage is set a final adjustment can be given to the plug; and, furthermore, by having the plug yielding it is allowed to give as the knife passes through the cork, and the operation of cutting is considerably facilitated. John Power, of Boston, Mass., is the inventor.

*Grease Cup.*—This invention consists in the application of two valves, connected together by a jointed stem, which can be easily lengthened or shortened, in combination with two seats, one above and the other below the bulb or reservoir of the grease cup, in such a manner that, by turning the handle attached to the valve stem in one direction, the lower valve is closed and the upper valve opened ready to admit the lubricating material from the receiving cup into the bulb, and by turning said handle in the opposite direction, the upper valve is closed and the lower valve opened, and the interior of the bulb brought in communication with the steam cylinder or other device to be oiled. In order to allow the steam and air contained in the bulb to escape, when it is desired to introduce the lubricating material into the same, it is provided with a spring valve, which will open by a slight pressure of the hand, and when released, close by the action of a spring combined with that of the steam in the interior of the bulb. Gebhard Hagenmeyer, of Big River, Cal., is the inventor.

*Jar for Well-boring Tools.*—In boring deep wells, such for instance as oil wells, a device is connected with the drill or drill rod to admit of the drill, in case of the latter becoming fast, being subjected to a series of blows or concussions in order to loosen it. This device, commonly termed a "jar," is indispensable in boring deep wells, owing to the great difficulty which would be otherwise experienced in withdrawing or loosening the auger. The ordinary jar in use is attended with some disadvantages. It is liable to get fast itself, and is subjected to considerable wear in consequence of being in contact with the grit in the wall of the well. It is also liable to break or give way when worn, and the withdrawing it from the well is attended with considerable difficulty; these disadvantages, it is believed, are fully obviated by this invention. Miles Joy, of West Greenville, Pa., is the inventor.

*Musical Instrument.*—The object of this invention is to improve the valves of cabinet organs and other musical instruments. It consists in so constructing the valve that the face thereof shall be free to adjust

itself to the valve seat. It also consists in a peculiar mode of connecting the face of the valve to its stock or shank, whereby it can be removed therefrom and again replaced, merely by laying off the spring which holds it against its seat. George Woods, of Cambridge, Mass., is the inventor.

*Machine for Tapering Spoke Tenons.*—The object of this invention is to obtain a simple, economical and efficient device for expeditiously tapering the tenons at the inner ends of spokes, whereby the proper dish is given the wheel. The invention consists in the employment of a reciprocating cutter, working or moving in a right line in connection with an adjustable gage, to which the spokes are applied when their tenons are tapered; the above parts are used in connection with stops, and all are so arranged that the desired work may be expeditionsly and accurately performed—far more so than can be done by the hitherto exclusive manual process or mode. Junius Foster, of Long Branch, N. J., is the inventor.

## Correspondence

### Cotton-picking Machines.

Messrs. Editors:—In your last issue you call attention to the importance of an invention for picking or harvesting cotton. I have had some experience in cotton culture, and from my own observation and the information gathered from others, I am firmly of the opinion that an economical machine which, with the same running expense, will perform four times the labor that can be done by hand, would be the most important invention that could be made at this time. Slaves were averse to using agricultural machinery, in fact, studied, "from the cradle to the grave, how not to do it."

But a new era has dawned. Slavery, with its snail-ish conveniences, is gone forever. And thousands of the hands that have heretofore picked the cotton in its season, and did little or nothing the balance of the year, will not be available hereafter. For if the negro is really free, he has the same right that any other freeman has to support his wife and children, without their being compelled to work in the field. Thus, gradually, the old source of extra hands for picking will be withdrawn. Now, in Illinois, three men, with six mules or horses, can cultivate 100 acres of corn; they commence plowing in April, and lay by their corn in July, doing the work in three months. Then the same force ought to be able to cultivate an equal area in cotton, with the same labor-saving appliances, in six or seven months—as they can break cotton ground in December or January, and lay it by in July. It is computed that one person will pick, by hand, from 6 to 10 bales of cotton. The average yield on the bottom lands of the Mississippi is one bale, of 400 lbs., per acre. Then, if three men can cultivate 100 acres, there must be some labor-saving invention to enable them to pick 100 acres, or here is a check on the expansive energies of our nation. If the country must support three or four times the number of inhabitants that are required to till the soil, simply in order to have the necessary force at hand to harvest the crop, then truly there is one spot where labor-saving agricultural implements are at a discount, because it would be better to have all the inhabitants constantly employed than loafing around while improved machinery did the work they could do in the old-fashioned way, quite as well as they could pick the crop. Therefore, in my opinion, for the quickening of the enterprise of the cotton region, and the general advantage of the people thereof, and the certainty of an independent fortune to the inventor, there is no invention so much wanted as a practical cotton picker. It would add at least one-half to the producing force of the cotton country.

Carroll.

New York, Aug. 3, 1865.

### A Huge Boiler of Platinum.

Messrs. Editors:—I notice on page 82, current volume of the Scientific American, a paragraph stating that the new apparatus of Messrs. Crosse & Blackwell, London, for boiling vinegar, is "aluminum;" I think it was intended for "platinum." I have the pleasure of inclosing you a sheet giving a few items in reference to the apparatus. It may interest our pickle men. As a matter of interest to another trade, I may mention the use of platinum crucibles instead of clay, at the great glass factory of St. Gobain, France, by M. Pelouze, in order to obtain the purest possible glass, free from the yellow tinge which has been so difficult to banish from clear flint glass. He uses amorphous and pulverulent phosphorus, in place of charcoal, in the mixture.

H. M. Raynor.

No. 748 Broadway, New York, Aug. 5, 1865.

[The platinum steam coil referred to in the above letter, is made of pure platinum tubing, proved at steam pressure of 60 lbs. per square inch. Its value is £800, or $4,000; and was manufactured for Messrs. Crosse & Blackwell, and used by them for boiling their pickling vinegar. The coil is the first of the kind that has been made; it boils 325 gallons of vinegar—the capacity of the vat—in an hour and a quarter, with steam at 30 lbs. pressure. It is made of pure platinum, autogenuously soldered. The length of tubing (an inch and a half in diameter) consumed being 32 feet, and was manufactured by Messrs. Johnson Matthey & Co., England.—Eds.

### Breech-loaders Triumphant!

Messrs. Editors:—When I began my crusade in favor of the adoption of breech loading fire-arms, in 1861-2, you will recollect that the subject not only met with the serious opposition of men in authority, but that it was absolutely treated with contempt by many, and my efforts were denounced as fanatical and in bad taste.

Well, since then the French Government has adopted them for its entire army; the English Government has advertised for proposals for changing all its guns to breech-loaders; our own Government has adopted them; and herewith I send you the circular of the Swiss Consul-General, inviting breech-loaders for trial, in order to secure the best for its army. So the world *does* move in spite of the old "fogies." Whose turn is it to laugh now?

It may not be generally known, but is a fact, that several, if not all the European governments have agents in this country looking up our improvements in fire-arms and other warlike implements. The recent war has opened the eyes of other parties besides John Bull, and the sequel is one of which our inventors may well feel proud, for all this is the direct result of their skill. The bravery of American soldiers and the skill of American inventors have secured for us a character among the nations of the earth which politicians and so-called statesmen could never have secured. It is a national compliment that our sister Republic should come here to select the best arms for her army, and one of which our inventors have a special right to feel proud.

W. C. Dodge.

Washington, D. C., August 1, 1865.

### Patent Sale Agency.

Messrs. Editors:—I saw in a recent issue of your journal an article entitled the "Defense of Patent Sale Agents," written by Mr. J. H. Beardsley, who, I must confess, takes the part of the agent very much like a man of sense, and I am very much obliged to him for his kindness in so doing; for he, in doing so, vindicates my cause as well as his. I saw the article he refers to and felt somewhat indignant at the spirit in which it was written. If the gentleman who wrote the first article will come to my office I will show him that patent agents are not all dishonest. I consider his article a slander not only upon Mr. Beardsley's business but upon mine, and every one who has anything to do with the sale of patent rights. He should be more careful and inquire into the business before he passes his opinion in such sweeping and public terms. If any man comes to me, and if, after full explanation of my terms, is not satisfied, he can go his way and I'll go mine. I have had no complaint yet, and do not anticipate any.

J. C. Davis.

Newark, N. J., July 28, 1861.

### Lee's Firearms Company

Messrs. Munn & Co.:—My subscription to your valuable paper having expired, I asked some of my workmen if they wanted to benefit themselves $25 per annum (and they are careless readers that can't do that), myself $500, and another party about $10. I admit the motive a selfish one, but, knowing your generous disposition, you will overlook that. I only wish manufacturers would look at it even in a dollars and cents light. In response, I send draft for ten copies of your paper from the beginning of the present volume, to be addressed to this office. Being the only establishment of the kind in the West, it is a pleasure for me to say that the rifle we are making was patented in 1862 through your very successful Agency. Our sporting rifle is much thought of by Western hunters, and they are a fastidious class. We are also finishing a contract for Government of carbines.

James Lee.

Milwaukee, Wis., July 31, 1865.

[We thank Mr. Lee for his generous appreciation of the value of our journal. We take this occasion, also, to thank our patrons for their efforts to increase our circulation. At the beginning of the present volume, with a view to encourage our readers to organize clubs, we decided to reduce our terms of subscription to $2 50 per annum for all clubs of ten or more names; this reduction has resulted in bringing us a large number of clubs. There is, however, room for more, and we hope there are hundreds of others who will now avail themselves of our liberal clubbing terms.—Eds.

### Why Plated Goods Tarnish.

Messrs. Editors:—In No. 2, present volume of the Scientific American, a correspondent inquires why electro-plated wares tarnish sooner under the same circumstances than solid silver articles. You answer him by stating, "It doubtless arises from imperfect cleaning of the electro-plated articles," and also state, "it is well known that the solution adheres, and cannot be removed by mere washing." Your explanation is correct to a certain extent. Careless and slovenly platers do leave some of the solution remaining in the pores of the metal—a very little of which does mischief. But good first-class platers remove all the solution, so there is seldom if ever any trouble from this source in really first-class goods.

The real and principal cause is this, viz.: In electro-plating pure silver is deposited on the article plated, and when removed from the solution the silver is in a soft, porous state. Passing the finger over the surface it feels like velvet. The microscope shows the spongy texture perfectly. If there is a thick deposit it is very difficult to compress and solidify the silver in burnishing, which leaves the silver more or less spongy. This is especially the case with goods plated on soft or britannia metal, as the metal under the silver yields under the pressure of the burnisher and fails to produce so solid and compact a surface as can be obtained on hard metal goods or solid silver. Now it is well known that a polished surface of pure silver is one of the most sensitive metals known, to the action of the various gases, moisture, etc., which prevail at almost all times and places; hence if these articles with pure silver surfaces, and those surfaces soft and more or less spongy, are exposed to the atmosphere for any considerable length of time they will be promptly acted upon by these agents, and tarnish. Solid silver articles have the advantage of at least ten per cent alloy—a very great protection against tarnishing; besides, these articles are drawn under the hammer and are as hard as the silver can be worked, having often to be annealed while in process of making. The surface is made very smooth, after which it is carefully burnished by a strong hand, which leaves the surface as smooth, hard and compact as is possible, which, with the alloy, is the great secret why it is less susceptible to tarnish than plated wares. Some of the finest qualities of goods, plated on fine German silver, can be finished so as to keep their color nearly as well as solid silver. The above is the result of ten years' experience and observation in the manufacture of plated wares.

If you think it would interest your readers I could give the best modes of preventing and removing tarnish on plated and solid silver wares.

E. W. C.

New York, Aug. 2, 1865.

[We should be pleased to receive the directions.—Eds.