

THE FLOATING STEAM FIRE ENGINES OF NEW YORK.

The immense value of the property lying along the immediate river front of this city, comprising storehouses, docks, and vessels and their cargoes, and the impossibility of effectually guarding it against fire, because of its inaccessibility except from the shore side, made imperative the adoption of some means of protection from the water side. Several years ago the steam propeller Wm. H. Havemeyer was equipped for the service, and, with steam constantly up, manned by an efficient and well trained crew, has never delayed responding to an alarm. It is difficult to estimate the importance of the services rendered by a boat of this description in confining a fire to the locality in which it started, yet this is one of the most essential duties of the river branch of the department. But some idea of the work required may be formed from the fact that during the year 1883 this boat responded to 139 alarms. At the warehouse fire in East Street, which began January 14 last, the pumps were running full capacity for 3 days, and the boat was kept on duty for 19 days, during which she worked for 413 hours.

But the territory to be protected is large, and last year a second boat—the Zophar Mills—took its station on the river. This boat is larger than the Havemeyer, and furnished with more powerful machinery, yet the general plans of the two do not vary essentially. They look like large tugs.

The Havemeyer, shown on the left in our engraving, is 115 feet long, is built of wood, and is provided with two double pumps of the Amoskeag pattern, of 5 inches diameter by 12 inches stroke, so arranged as to be worked either combinedly or independently. There are eight streams, all or any of which may be used, arranged to deliver from either side of the boat. When working full capacity, the pumps will deliver 1,400 gallons of water per minute, which is about equal to five first-class fire engines.

The Zophar Mills has an iron hull, is 126 feet long, and has two pairs of duplex pumps $7\frac{1}{2}$ inches by 9 inches, with steam cylinders $16\frac{1}{2}$ inches diameter. These engines will throw 2,200 gallons per minute through eight pipes, and will throw a two-inch stream 300 feet.

Each boat has a boiler capacity in excess of that required for pumping, in order that she may be propelled at the same time her pumps are in operation. The speed is about 12 miles per hour. These boats have delivered a large stream through 1,000 feet of hose. The Havemeyer is kept at the Battery and the Zophar Mills at Thirteenth Street, North River.

Our engraving vividly illustrates a fire where the services of these boats could not be replaced—a fire in mid-stream, and almost directly under the flooring of the great suspension bridge. On the morning of December 13, 1883, the double deck ferry boat Garden City, plying between James Slip, this city, and Long Island City, was discovered to be on fire just after she had left her pier on the up trip. The superstructure being light wood the flames spread rapidly, and the upper deck was enveloped before help arrived. Streams from several tugs which happened to be in the vicinity were turned upon her, and the progress of the fire was considerably checked, but not until the arrival of the Havemeyer was there a sufficient supply of water to confine the fire with any degree of certainty. As soon as possible the boat was towed to the shore, where fire engines were waiting to lend their aid. As it was about noon there were but a few passengers on board, all of whom escaped without injury.

The small engraving represents the engine room of the Havemeyer.

Tree Planting.

So small would be the money outlay, so inconsiderable the labor required, to insure for the next generation a wealth of timber land equal to that of which we have the benefit, and shade and shelter trees in even more adequate supply, that it is a great wonder to us, amid all the forcible facts brought forward against the rate at which forest destruction is going on, there has been no more general movement in favor of tree planting. In Germany and Austria, for upward of half a century, the number of trees planted has borne a good proportion to those annually cut down, and it is certain that this is the case now, year by year. In France, Italy, and England, also, tree cultivation is now general, and is held to be a most important matter of public concern. But here, with the characteristic improvidence which has come to be considered a marked feature of American character, we are destroying our great virgin forests with a rapidity never before equaled in any other country, and without taking any measures to insure their future growth.

Spurious Tartar Emetic.

M. Castelhas has in a recent circular called the attention of consumers to the sophisticated, or rather spurious, samples of antimony potassium tartrate now in market. This compound is used on the large scale for fastening certain coal tar colors upon cotton, and being of course costly the attempt has been made to employ the corresponding oxalate as a substitute. The effects of this new salt both upon the fiber and upon the colors are not in all cases satisfactory, and its admixture with, or clandestine substitution for, the double tartrate is certainly a fraud. For its detection the following simple test is proposed: A portion of the sample is dissolved in distilled water, acidified with pure acetic acid, and a solution of calcium chloride is added. If an oxalate is present a white precipitate is formed, while in case of a genuine double tartrate the solution remains clear.

Women as Inventors.

A writer in the *North American Review* gives the following list of inventions recently patented in the United States by women. But the writer has omitted from his list a large number of patents which have been granted to the fair sex, some of which have proved of considerable value to the patentees.

The writer commences his list with a spinning machine capable of running from 12 to 40 threads; a rotary loom doing three times the work of an ordinary loom; a chain elevator; screw crank for steamships; a fire escape; a wool feeder and weigher, one of the most delicate machines ever invented, and of incalculable benefit to every wool manufacturer; a portable reservoir for use in case of fire; a process for burning petroleum in place of wood and coal for steam generating purposes; an improvement in spark arresters, to be applied to locomotives; a danger signal for street crossings on railways; a plan for heating cars without fire; a lubricating felt for subduing friction (the last five all bearing upon railroad travel); syllable type, with adjustable cases and apparatus; machine for trimming pamphlets; writing machine; signal rocket used in the navy; deep sea telescope; method of deadening sound on elevated railways; smoke burner; bag folding machine, etc. Many improvements in sewing machines have been made by women—as, a device for sewing sails and heavy cloth; quilting attachments; the magic ruffler; threading a machine when it is running; an adaptation of machines for sewing leather, etc. This last was the invention of a practical woman machinist, who for many years carried on a large harness manufactory in New York city. The deep sea telescope, invented by Mrs. Mather and improved by her daughter, is a unique and important invention, bringing the bottom of the largest ships to view without the expense of raising them into a dry dock. By its means wrecks can be inspected, obstructions to navigation removed, torpedoes successfully sought for, and immense sums annually saved to the marine service. A machine which, for its complicated mechanism and extraordinary ingenuity, has attracted much attention both in this country and Europe, is that for the manufacture of satchel-bottom paper bags. Many men of mechanical genius long directed their attention to this problem without success. Miss Maggie Knight, to whose genius this machine is due, it is said refused \$50,000 for it shortly after taking out her patent. Miss Knight has since invented a machine doing the work, the writer says, of 30 persons in folding bags, and herself superintended the erection of the machinery at Amherst, Mass.

An Electric Microscope.

A number of gentlemen lately assembled at the exhibition court of the Crystal Palace, by invitation of the directors, to witness the first representation in England of *Les Invisibles*, an exhibition of natural objects magnified and displayed by means of the great electric microscope. The apparatus used in the exhibition is the invention of Messrs. Bauer & Co., and *Les Invisibles* has quite recently attracted a good many visitors to the old Comedie Parisienne, where, as well as at the Athenæum at Nice, a series of representations has been given. The invention may be described in a few words as being the application of electric light to the microscope, and the result, so far as the spectacle is concerned, is a sort of improved and enlarged magic lantern. Every one is familiar with the former exhibitions at the Polytechnic and elsewhere of the animalcules in a drop of water, magnified and thrown, by the aid of the lime light, on to a white screen. Precisely the same sort of effect was produced on Saturday by Mr. F. Link, the London agent for Messrs. Bauer & Co., with this difference, that the magnifying power was enormously in excess of that attained in the old magic lantern entertainments. The electric microscope has, in fact, made it possible to exhibit in a most attractive form the appearances presented by minute natural objects when placed under the most powerful magnifying glass. Indeed, the difficulty with which Mr. Link had to contend on Saturday was the smallness of the screen upon which his pictures were thrown. For instance, only a small section of a butterfly's wing could be shown at a time, although the screen was as large as the size of the entertainment court would permit, while the living organisms in a spot of water and the mites in a small piece of cheese were enlarged until they presented a perfectly appalling spectacle to a timid mind. The capabilities of the apparatus may be imagined from the fact that the eye of a fly was presented in a form no less than four million times its natural size. The electric microscope, which is worked by an ordinary primary battery, may be said to have extended almost indefinitely the possibilities of presenting in an attractive and instructive manner the wonderful facts of natural science.

Death of Dr. Elisha Harris.

Dr. Harris, the Secretary of the New York State Board of Health, aged 60 years, died in Albany, January 31, from peritonitis. In 1855, he was placed in charge of the New York quarantine, the details of whose system he perfected, establishing in 1857 the floating hospital below the Narrows. During the Civil War he was a member of the National Sanitary Commission, and devised the railway ambulance, afterward adopted in the German army. Dr. Harris has been conspicuously active as a member of the city and State Boards of Health, and in 1869 took a leading part in making the first thorough tenement house sanitary survey in New York city. In the way of compulsory ventilation of dark bedrooms,

over 50,000 windows were put in according to his suggestions. He was also very active in establishing the system of public vaccination. Dr. Harris was identified with the Association for Improving the Condition of the Poor, and was a member of the County Medical Society, the New York Academy of Medicine, the Physicians' Mutual Aid Association, the Society for the Relief of Orphans and Widows of Medical Men, the *Medical Journal* Association, and the Public Health Association of New York. He was also an active or honorary member of various other associations and societies in this country and Europe. He was consulting physician to the country branch of the Nursery and Child's Hospital. He was a voluminous writer of works on sanitary and philanthropic subjects and also on questions relating to vital statistics.

Milk Diet in Bright's Disease.

Since we know not at present any drug that possesses therapeutic value to any marked extent in this terrible and fatal disease, and since it is daily making sad havoc among human beings, and principally among that class who, by reason of their valuable public labors, are particularly necessary to the welfare of the world, therefore, it becomes a medical question of paramount interest that we should discover some potent method of combating this very prevalent disease. Some years since Carel first called attention to the treatment of Bright's disease by the use of a milk diet, and since then Duncan, as well as many other prominent physicians, has written on this subject.

We have ourselves seen some remarkable results follow this treatment, while Dr. S. Weir Mitchell, of our city, is now quite an enthusiast on this subject. This method of treating a formidable disease has received sufficient distinguished indorsement to recommend it seriously to our notice. We would, therefore, ask all physicians who read this article to try this method of treatment and to furnish us with their experiences, which we will publish. The milk is used thoroughly skimmed and entirely freed from butter. To procure the best results, it has been advised that the patient shall restrict himself absolutely to milk and continue the treatment for a long time. If it disagrees with the stomach (as it will in some cases), Dr. Mitchell advises that the patient be put to bed and the treatment commenced with tablespoonful doses, to which lime water is added, until the stomach tolerates the milk, when from eight to ten pints daily should be taken, and absolutely nothing else. The sanction of such a distinguished physician as Dr. Mitchell forces us to seriously consider the merits of this treatment, and we trust to receive the experience of all readers of this journal who may have cases of Bright's disease to treat.—*Med. and Surg. Reporter.*

Built Up Wood.

Several thin sheets of wood—they are called veneers, though they are sometimes an eighth of an inch thick—are glued one upon another, with the grain of each sheet crossing the grain of the sheet next above or below it at right angles; and, when the whole complex fabric has lost all power of resistance through being almost saturated with steaming glue, it is pressed into an almost homogeneous board without any cleavage whatever, and so without possibility of splitting. Every sort of wood, of course, can be built up. The inside layers can be cheap and the outside choice. No matter whether or not the different sheets naturally swell and shrink evenly together. They are too thin to exert much force. Their separate identities are lost in the common and overmastering union. The advantages of economy, strength in every direction, and immunity from cracking are enough to give the fabric the readiest possible acceptance for whatever uses it may be adapted. It is already in use for broad, flat surfaces in cabinet work, especially where strength or permanence is wanted. It already competes with canvas for the use of artists, and with binders' board for book covers. Its availability for any purpose appears to be a matter of expense and skill—never of quality. That it will be adapted to many uses not now thought of is as sure as the inventive fertility of our mechanics.

Weighing Silver Dollars.

In the mint at San Francisco there are fifty women employed at a salary of \$2.75 per day. The hours are from nine o'clock in the morning until four in the afternoon, with the exception of Saturday, when work ends at two. Their business is to weigh the gold and silver after it has been rolled, annealed, cut, and washed, and they are known as adjusters. Each piece should weigh $412\frac{1}{2}$ grains for a silver dollar to be up to the standard, a slight discrepancy being allowed on either side. If a coin is found to be outside the limit, it is returned by the adjuster; if too light, it is condemned, and must be remelted; if too heavy, it is filed to its proper weight.

The Reis Telephone of 1864.

Mr. H. F. Peter is a teacher of music in the village of Friedrichsdorf, Germany, which was for many years the home of Philipp Reis, and which contains the Garnier Institute, where he was instructor in physics. Herr Peter states that he was present at Reis' experiments, and can testify that audible speech was actually reproduced by his telephone. He says that many members of the "Physikalischer Verein," of Frankfort-on-the-Main, were also present.

SCIENTIFIC AMERICAN

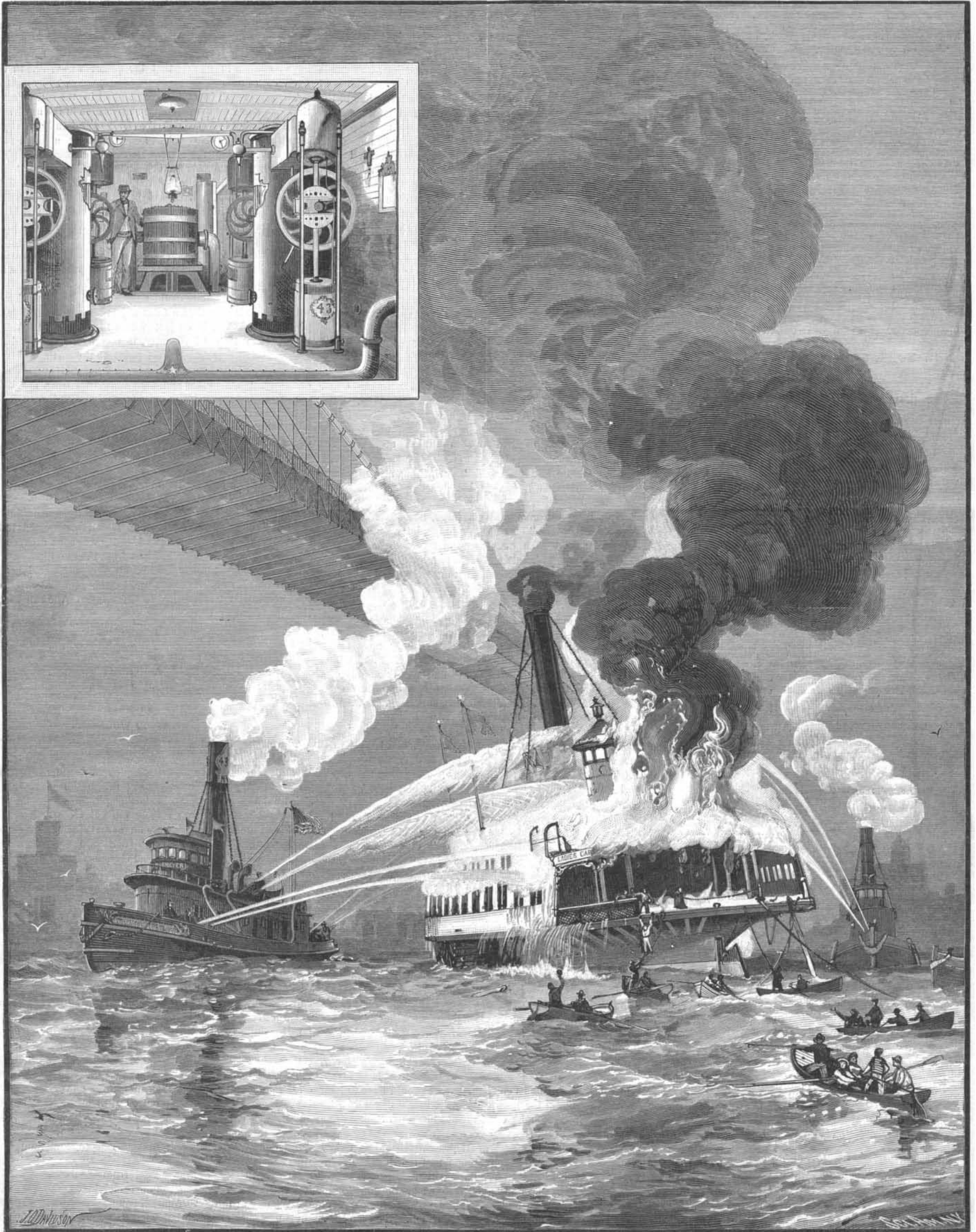
[Entered at the Post Office of New York, N. Y., as Second Class Matter.]

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. L.—No. 7.
[NEW SERIES.]

NEW YORK, FEBRUARY 16, 1884.

[\$3.20 per Annum.
[POSTAGE PREPAID.]



THE FLOATING STEAM FIRE ENGINES OF NEW YORK.—BURNING OF THE FERRYBOAT GARDEN CITY.—[See page 100.]