SCIENTIFIC AMERICAN

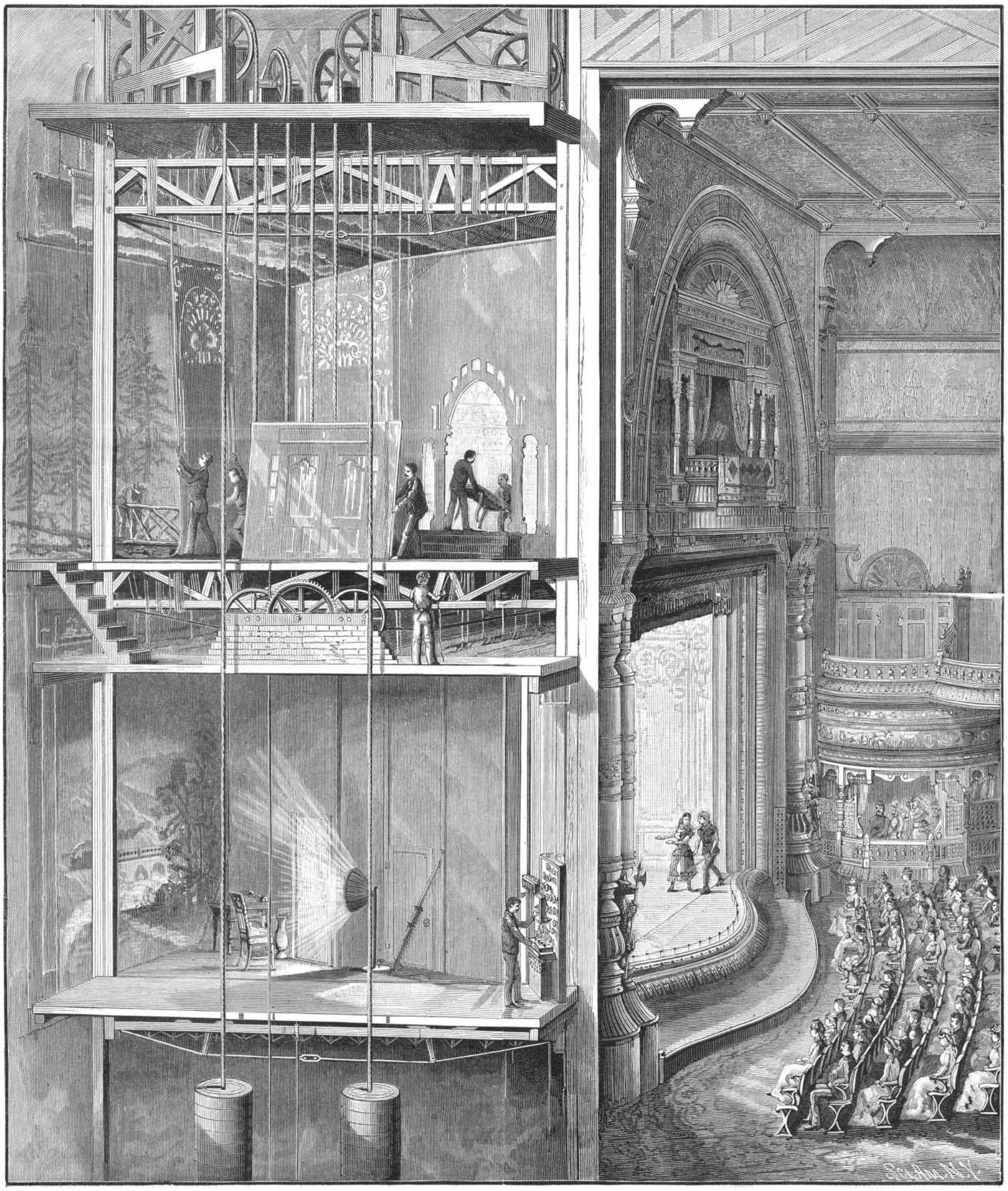
[Entered at the Post Office of New York, N. Y., as Second Class Matter.]

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

Vol. L.—No. 14. [NEW SERIES.] NEW YORK, APRIL 5, 1884. [$3.20 per Annum. [POSTAGE PREPAID.]

MOVABLE THEATER STAGES.

For a few years back, or since Richard Wagner first brought out the Niebelungen-lied at Bayreuth, the tendency in first class theaters and opera houses has been to greater elaboration of the scenic details, the more vivid representation of the surroundings connected with the plot of the play or opera. It was on this account that a temple was specially built in which to present the best illustration of the "music of the future." Thus also has Mr. Henry Irving obtained phenomenal success in England, and won great favor here, by the hard study and unstinted labor he gives to the perfecting of the scenery and stage equipments for the setting of his plays. Yet in all of the additional work now demanded of stage managers, there has been but little aid extended by inventors, and but few theater appliances patented. The illustration we herewith present, however, affords a view of an improvement practically tested at the Madison Square Theater in this city, which has not thus far



THE MOVABLE STAGE AT THE MADISON SQUARE THEATER, NEW YORK.

been put in operation in any other theater, and which would seem to afford every facility for the elaborate setting and changing of scenes without necessitating long "waits" on the part of the audience.

Our illustration affords a view of two theatrical stages, one above another, to be moved up and down as an elevator car is operated in a high building, and so that either one of them can easily and quickly be at any time brought to the proper level for acting thereon in front of the auditorium. The shaft through which this huge elevator moves up and down reaches 114 feet from the roof to the bottom of the cellar below, and the stages so moved are built up in a compact, two-floored structure of timber strapped with iron, knitted together by truss beams above and below, and substantially bound by tie and tension rods. The whole makes a structure fifty-five feet high, twenty-two feet wide, and thirty-one feet deep, weighing, as stated by the management, forty-eight tons, and having a vertical movement of 25 feet 2 inches at each change.

This immense contrivance is suspended at each corner by two steel cables, each of which would be capable of sustaining far more than the whole load, and these cables pass upward over sheaves or pulleys set at different angles, thence downward to a saddle, to which all are connected. Connected to this saddle is a hoisting cable, attached to a hoisting drum, by the rotation of which the stages are raised and lowered. Practically, only forty seconds are required to raise or lower a stage into position, and four men at the winch are as much as is ever required. This movement is thus easily effected, without sound, jar, or vibration, from the nice balancing of the stage and its weight with counterweights, which are suspended from the saddle to which the cables supporting the weight of the stages are attached.

In combination with each of these movable stages are borders and border lights arranged to throw light down upon the stage, and so connected with flexible gas tubes as to be readily turned on and off; each stage has its trap floor, with traps and guides and windlasses for raising the traps—the space for this, and for operating the windlass under the top stage, being about six feet. Our illustration shows that, while the play is proceeding before the audience, another scene is being arranged by the assistants on the upper stage, to be followed, when this is lowered, by similar preparations for the succeeding scene, should this be necessary, on the stage that will then be twenty-five feet below.

Independent of the peculiarity of the movable stages, there were many innovations on former practices in the fitting up of this, one of the pleasantest of New York's theaters, some four years ago. Fresh air is forced over steam radiators and through pipes to every part of the floor of the auditorium, or it is cooled and sent through the same pipes in the summer, but under such a system that it can conveniently at any time be shut off from any section; there is also a ventilating shaft in the roof through which the vitiated air is carried off, so that the whole atmosphere of the house is renewed, it is claimed, six times in every hour. [The whole matter of the ventilation of the Madison Square Theater was fully explained, with illustrations, in SCIENTIFIC AMERICAN SUPPLEMENT, No. 250.] Another noticeable feature is that the orchestra, instead of occupying the usual position just below and in front of the stage, is placed in a balcony at the top, just over the stage opening, in the proscenium arch, thus keeping the view of the stage from the parquette unobstructed.

Not a little fun was made of Mr. Steele Mackaye, in 1879, when he obtained his patent for and proposed to build the first movable stage, as here represented. The details of Mr. Mackaye's patent were not as completely worked out, although the idea was there, as they subsequently were by Mr. Nelson Waldron, the stage machinist, who elaborated the system and obtained a subsequent patent therefor, under which these movable stages have since been so successfully and satisfactorily operated at the Madison Square Theater.

The architecture of this theater, by Messrs. Kimball and Wisedell, and the decoration, by Mr. Louis C. Tiffany and Mrs. Wheeler, have received wide and deservedly high praise; many features were novelties, but there was nothing inappropriate or commonplace.

The Phonograph in Africa.

It is said a Congo traveler will invite the natives to talk into one of these devices, the tin foil negatives to be sent to Berlin and studied by experts. Why would not this be a good way of obtaining explicit information as to the views of the natives upon the differences between De Brazza and Stanley? We believe the phonograph is now tolerably successful in reporting spoken words—that is, provided the hearer *already* knows what has been said into it, and what he may, consequently, expect to hear—so that on a subject of this character the confusion of tongues at the tower of Babel would probably be simplicity itself compared with what the machine might be made to report.

Clothing and Food for Arctic Explorers.

There will be, in all, three vessels and 140 men, of whom 20 are officers, shortly starting on the Greely relief expedition. Every precaution which former experience has pointed out is evidently being taken to provide for the safety and, so far as possible, the comfort of these Arctic voyagers. In the clothing, which is made to measure for each one, officers and men are to be fitted out alike except as to the badges of rank.

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

No. 261 BROADWAY, NEW YORK.

O. D. MUNN. A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year postage included..... $3 20
One copy, six months postage included 1 60

Clubs.—One extra copy of THE SCIENTIFIC AMERICAN will be supplied gratis for every club of five subscribers at $3.20 each; additional copies at same proportionate rate. Postage prepaid.

Remit by postal order. Address

MUNN & CO., 261 Broadway, corner of Warren street, New York.

The Scientific American Supplement

is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, $5.00 a year, postage paid, to subscribers. Single copies, 10 cents. Sold by all newsdealers throughout the country.

Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year postage free, on receipt of *seven dollars*. Both papers to one address or different addresses as desired.

The safest way to remit is by draft, postal order, or registered letter. Address MUNN & CO., 261 Broadway, corner of Warren street, New York.

Scientific American Export Edition.

The SCIENTIFIC AMERICAN Export Edition is a large and splendid periodical, issued once a month. Each number contains about one hundred large quarto pages, profusely illustrated, embracing: (1.) Most of the plates and pages of the four preceding weekly issues of the SCIENTIFIC AMERICAN, with its splendid engravings and valuable information: (2.) Commercial, trade, and manufacturing announcements of leading houses. Terms for Export Edition, $5.00 a year, sent prepaid to any part of the world. Single copies 50 cents. ☞ Manufacturers and others who desire to secure foreign trade may have large, and handsomely displayed announcements published in this edition at a very moderate cost.

The SCIENTIFIC AMERICAN Export Edition has a large guaranteed circulation in all commercial places throughout the world. Address MUNN & CO., 261 Broadway, corner of Warren street, New York.

NEW YORK, SATURDAY, APRIL 5, 1884.

Contents.

(Illustrated articles are marked with an asterisk.)

TABLE OF CONTENTS OF

THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 431,

For the Week ending April 5, 1884.

Price 10 cents. For sale by all newsdealers.

PROBABLE DEFEAT OF THE BAD PATENT BILLS.

The vigorous efforts made during the past few weeks by the friends of industry and invention to enlighten the minds of their representatives in Congress concerning the evils likely to follow the proposed patent legislation have been attended with good results.

In the SCIENTIFIC AMERICAN for March 15 we summarized the nature of the evils that would follow if the bills then under consideration were passed—naming the Anderson bill, for reducing the lifetime of patents to five years; the Voorhees bill, for giving to anybody who wished it the free right of any patent; and the Calkins bill, for diminishing the value of property in patents by obstructing the patentee in appealing to the courts. This article was quoted at some length by the Associated Press, and sent by telegraph to all parts of the country. It had an immediate effect in arousing individual action in many places, which took shape in the organization of public meetings, the passage of resolutions, the sending of hundreds of public and personal petitions to Congressmen, and the presentation to them of a large mass of valuable evidence, all tending to show how wrong and unwise the proposed enactments were likely to be. That the information thus furnished to Congress has had weight with some of the members is seen in the rejection by the Patent Committee of the Anderson five year bill, and the further postponement of the other bills. The chairman of the House Committee on Patents, on March 22, read the following:

"This bill (H. R. 3,617) proposes to amend section 4,884 of the Revised Statutes by striking out the word 'seventeen' and inserting the word 'five,' and thereby make a most radical and unjust change in the patent laws of this country, its effect being to limit the life of a patent to five years. Such a change is not consistent with the spirit of our Constitution and laws made for the benefit and encouragement of inventors, and would be an act of gross injustice to the great mass of inventors of this country, who have done so much to develop the growth, wealth, and prosperity of the country. As to the right of property which the inventor has in his inventions, a recent and learned writer on patent law says: 'The right of property which an inventor has in his invention is excelled in point of dignity by no other property right whatever.' Contrasted with him who acquires property by inheritance or devise, contrasted with him who acquires property by marriage or donation, contrasted with him who acquires property by revenue from the barter of merchandise or from the yield of money loaning, he who acquires property by invention, by bringing into being things which before were not, stands pre-eminently and confessedly on a higher foundation.

"The same learned writer again remarks: 'The inventor is not the pampered favorite or beneficiary of the Government or of the nation. The benefits which he confers are greater than those which he receives. He does not cringe at the feet of power, nor secure from authority an unbought privilege. He walks everywhere erect, and scatters abroad the knowledge which he created. He confers upon mankind a new means of lessening toil, or of increasing comfort, and what he gives cannot be destroyed by use or be lost by misfortune. It is henceforth an indestructible heritage to posterity. On the other hand, he receives from the Government nothing which costs the Government or the people a dollar or a sacrifice. He receives nothing but a contract which provides that for a limited time he may exclusively enjoy his own.'

"The committee are unanimously of the opinion that the present limit of seventeen years is a reasonable limit, and therefore recommend that the accompanying bill do not pass."

Nothing could be more satisfactory than the promulgation in Congress of sentiments like these, which, it is safe to say, are earnestly shared by the mass of the people of the United States.

This excellent report was followed on the 24th of March by a resolution of inquiry, which we hope will be promptly passed. It was read by the Hon. Mr. Vance, and referred to the Patent Committee of the House:

"*Whereas*, Information has been obtained, from sources entirely trustworthy, which indicates that the full, thorough, expeditious, and accurate administration of the laws and regulations which pertain to our great American patent system is being obstructed and impeded on account of a deficiency in the room and an insufficiency of force at the disposal of the Department of the Interior; therefore,

"*Resolved, etc.*, That the Secretary of the Interior be, and he is hereby, requested to report to this House such information as he may have touching the deficiency of room and the insufficiency of force in the Patent Office, and to what extent, in his opinion, the rights of inventors and the public interests are affected by the present want of room and additional force in that department; and that he be requested to make such suggestions as he may deem proper as to what legislation is necessary to remedy the grievances indicated."

In respect to the other bills, their immediate consideration has been postponed, and their passage looks somewhat doubtful. It is, however, desirable that all who have views to express or information to furnish should send the same to Senators and Representatives—who in this way become informed as to the true needs of their constituents, and are enabled to govern their legislation accordingly.

The convention of the National Association of Inventors assembled at Cincinnati, Ohio, on the 25th of March, and was