THE
Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

☞ American and Mexican News Company, Mexico, are Agents for the SCIENTIFIC AMERICAN.

☞ Messrs. Trubner & Co., 60 Paternoster Row, London, are also Agents for the SCIENTIFIC AMERICAN.

☞ "The American News Company," Agents, 121 Nassau street, New York.

VOL. XV., No. 26 [NEW SERIES.] *Twenty-first Year.*

NEW YORK, SATURDAY, DEC. 22, 1866.

Contents :

(Illustrated articles are marked with an asterisk.)

EXPIRING SUBSCRIPTIONS.

The present number closes the volume, and in accordance with our usual custom, we discontinue the paper upon expiration of the time for which the subscription was paid. We expect to keep all our old subscribers, and to add largely to our list on the new volume.

NO. 1 ADVERTISERS.

Parties who intend to advertise on the outside page of the first number of the new volume, should send their advertisements without delay. The terms are seventy-five cents per line for each insertion. To enable advertisers to calculate how much they must remit, we will state that, independent of the head line, about seven words will make a line of agate type. It will be safe to estimate but four words for the head line.

Engravings will be inserted with advertisements at $1 a line for the back page and 75 cents a line on the inside. The rates for ordinary advertisements in the inside, 40 cents a line.

BRING OUT YOUR INVENTIONS.

The enlargement of the SCIENTIFIC AMERICAN, commencing with the next issue, will enable us to insert in each issue a much larger number of engravings than our limited space has heretofore admitted. We have increased our force of designers on wood, so that orders for engraving of new inventions and machines can be filled more promptly than heretofore.

There is no way in which any new invention can be so extensively and advantageously brought to the attention of the public as by having good engravings of it published, with a description, in the SCIENTIFIC AMERICAN. Thousands who have tried it can testify to this fact.

To patentees, and those who wish to have their inventions illustrated in this Journal, the following general directions will be their guide :—

In preparing engravings for publication in the SCIENTIFIC AMERICAN, the use of a model from which to make the design, is preferred. If it is inconvenient, however, to send a model, a well-executed photograph, taken from a machine or model, will usually answer the purpose. The Letters Patent should be sent with a statement of the advantages claimed for the invention. After the order is received the engraving will be prepared and published, and the model, patent, and engraving returned by express. For further information address Publishers of this paper.

IMPORTANT SUGGESTIONS.

The enlargement of the SCIENTIFIC AMERICAN will enable us to publish all the patent claims in each regular issue, and obviate the necessity of the extra claim sheet, which we have lately been obliged to add.

Other important improvements are to be made which will render the paper more attractive than any publication of its class heretofore published. Subscribers, whose time expire with this issue, should renew their subscription at once, so as to be sure of all the numbers.

We shall endeavor to print enough of the few first numbers to supply all demands, but the great rate at which new subscribers are coming in renders it difficult for the Publishers to determine the extent of the edition to print at first.

THE VALUE OF A SCIENTIFIC AND MECHANICAL JOURNAL.

Before the advent of railroads and the establishment of the telegraph, when travelers went from point to point by the stage-coach or by private conveyance, information was as slow and uncertain in transmission as passengers. The knowledge gathered by one man, under circumstances and by experiences not common, but liable to all, was his own personal property to be transmitted to his children, or mayhap to die with him. There were secrets in every trade and profession (there are too many now), and he who obtained the lore gained from the niggardly teacher, experience, was compelled to pay a price wrung from his golden years and laborious sinews.

To a certain extent this is true now, but knowledge is like the water poured into an overflowing bucket. He who has not capacity to hold, or capability to use, must let it go from him, although when it has only moistened his lips, it fills and satisfies others. Mystery in mechanics has had its day. The cabalistic formulæ of the chemists have been interpreted, and all who choose, may walk the road of knowledge, gleaning here and gathering there ; in fact, stopping at stations by the way, and drawing from magazines filled with the experiences of ages and enriched with the experiments of those who have but just preceded them.

These magazines of valuable information for the scientist and mechanic, are the journals devoted to scientific and mechanical subjects. In these the stray and floating particles of knowledge are gathered, sifted, and presented in their real character. If some of them are but froth on the sea of knowledge, they are dissipated in the rays of true science ; if real and valuable, they are divested of the barnacles of prejudice, egotism, persiflage, and trash, and shown as they really are.

This work of sifting, choosing, and preparing is the proper business of the journalist—the editor of a scientific paper. He saves the seeker after knowledge from the dreary labor of searching records, the impossible task of endless correspondence, and the continual inquiry after "some new thing." To the scientific student, the beginner in mechanics, the seeker after the hidden wisdom of nature's laws, and the practical worker in accordance with those laws, the scientific and mechanical periodical is an ever-present friend and assistant. It saves him hours of hard thinking, days of fruitless labor, the shame and vexation of unaccomplished endeavor, and periods of weary waiting. It assists him in his attempts at discovery, unravels hard knots in his line of theory, gives him valuable hints in his attempt to use the forces of nature, shows him his error, and points to the right road. By knowing the errors and failures of others, he is enabled to steer clear of obstacles, or by understanding the methods used by others, he is assisted in surmounting them. If a practical man, he is periodically informed of what is being done in his specialty, and thus kept from wasting his energies on labors already accomplished, and is enabled to utilize the brains and labors of others. In short, a "live" mechanic must as certainly keep up with the times as a politician or a statesman. To do this there is but one course, and that is to read a journal which is devoted to the recording and elucidating of the truths necessary for him to know.

IMPROVED PIER AND WAREHOUSE SYSTEM FOR NEW YORK.

The pending legislative inquiry into the harbor accommodations of our great seaport cannot be considered premature. The character of its wharfage is a drag and a disgrace to the prosperity of a commercial metropolis like this. Rude, primitive, rotten structures of logs, crowded and choked, exposed and insecure, infested with thieves, and more or less embanked with ship-stranding mud, are not the sort of accommodations to which the commerce of the world should be invited. The want of proper space and apparatus prolongs the discharge and taking in of cargoes, often four-fold. The entire absence of wharf storage involves a constant waste of time and expense, and an aggravated obstruction of the streets, in transporting merchandise back and forth between the shipping and the warehouses. Warehouses scattered all over town, and interspersed among other buildings, hazardous in every degree, involve the frequent destruction of vast amounts of merchandise by fire. The ill-constructed water-front promotes instead of preventing the obstruction of the docks and channels, and the detention of a pestilential sewerage. The whole system, wretched as it is, instead of being a profit, is a constant expense to the city treasury.

It is to be hoped that the labors of the legislative commission will not be completed without the adoption of a mature system of wharfage, uniform, and adequate to meet the wants and remedy the evils now so severely felt, together with a business-like plan for carrying the improvement into effect without creating inordinate monopolies, whether moneyed or municipal.

The comprehensive and convenient plan of wharf structures put forth by the projector of "The New York Pier and Warehouse Company" (Mr. G. Burrows Hyde), seems eminently worthy of consideration. It may be stated in a very few words. A continuous bulkhead of durable stone masonry is to define the water front, and act as a deflector for the discharges and deposits which now accumulate in the slips. Piers are to be built of prescribed dimensions, according to the requirements of the channel and tides, resting upon great hollow pillars of iron, exhausted and driven down by pneumatic pressure, and then filled with masonry or concrete under pressure, so as to form artificial stone. The space between these pillars will allow a free flow of the tides and deposits, and will be sufficient also to admit of dredging. The pier will support a fire-proof warehouse of iron, five stories high : the first story, on the street level, being open on all sides as a wharf, yet covered from the weather, and capable of being securely closed at night by iron gates or rolling shutters, and furnished with steam hoisting apparatus for the rapid discharge and loading of vessels, and dispatch of carts. The second floor may be used, where necessary to avoid obstructing the pier, for the temporary deposit of goods awaiting stowage or removal ; and the whole warehouse proper will afford secure storage for merchandise, on the spot, to any required extent, at the least of expense and inconvenience to parties or the public. The steam, always up in these warehouses for hoisting purposes, would also be available in connection with powerful stationary fire engines, for extinguishing fires among the shipping, which have been so calamitous in repeated instances. Wharf thieving and smuggling could also be effectually circumvented. It is evident that the profits of warehousing and wharfage on this plan would attract abundant capital for the construction of the buildings, in accordance with proper legislative regulations, and