

Scientific American.

NEW-YORK, JANUARY 5, 1856.

Progress of Invention During 1855.

The year eighteen hundred and fifty-five is now numbered with the past, and its days, hours, and minutes never will return again. But if time is evanescent, and is continually fleeting backwards, the actions of the present, on the contrary, surge upon the future and affect the destinies of coming generations. No man can live to himself; his actions affect others for good or evil; and their influence extends far beyond his own brief term of life. Every man, therefore, should do his best every day; and whatever good thing his hands find to do, he should do it with all his might. The present is a good and proper time to take a look behind, and briefly review the actions performed in the world of science, and art, during the circle of time which has just been completed.

The year that is gone has been prolific in invention, discovery, and industrial improvement. No less than one thousand nine hundred and forty-six patents (not including forty-nine reissues) were granted by our Patent Office from the second of January last year, up to the date of the list of patent claims on another column this week. This is the greatest number ever issued in one year from the Office—one thousand nine hundred and two being the number issued in 1854. The great majority of these were for improvements on well known machines, for new machines applied to accomplish results for which machinery had not previously been adapted, are necessarily few in number. Some improvements on machinery, however, are of more value and importance than the conception and construction of the original machines. This was the case with the improvements of Watt on the steam engine, and Morse on the telegraph, and no doubt many of the improvements for which patents were granted last year, will effect corresponding results in the machines which have been improved. A very remarkable number of patents were granted for improvements on the oldest of all power motors—the windmill. On many of the vast plains of our country, and along our extensive sea coast, where fuel is expensive, and where no water power can be obtained, the supply of wind power to drive machinery for pumping water, grinding grain, sawing and planing timber, and many other useful purposes, is abundant. It is to be hoped that recent windmill improvements—the majority of which have been illustrated in our columns—will be found, in practice, to have removed old defects, and so perfected this venerable motor as to render it of as great value to thousands of our people, in many sections of our country, as the water wheel is to thousands in other sections. It is impossible for us to refer however succinctly, to the distinct classes of inventions for which such a great number of patents were granted; we present the number issued, well knowing that from this data, the solid inference to be drawn, is, that every department of mechanism must have been greatly enriched by contributions from the brains and hands of our acute-thinking, deep-designing, and hard-working inventors.

Next to the World's Fair in London, in 1851—which it surpassed in some respects—the greatest Exhibition of Industry ever held in the annals of history, was the one in Paris during the past year. At that exhibition, America, though represented by few of her children, stood out pre-eminently among the nations of the old World; and her sons of mechanical genius were awarded more prizes in proportion to their number than those of any other country. If there were nothing else to record at the end of the year than these triumphs—these monumental milestones marking the progress of invention—of our countrymen, it would be enough to give us abundant satisfaction.

A chaplet has been won by the efforts of our daring navigators, in the discovery of the open Polar Sea by Dr. Kane; and the nation's heart has been thrilled with gratitude for his safe return with his adventurous compatriots.—The last link has been added to the continuous

navigation of the chain of great lakes from Superior to Ontario, by the completion of Saut St. Marie Canal. The great suspension bridge by Roebling, across "Niagara's waters dark and deep," has also been completed, and the locomotive now whirls his ponderous train over the boiling abyss. The largest steamship ever launched on our continent—the *C. Vanderbilt*—has recently been added to our commercial marine. The U. S. Exploring Expedition in the Pacific Ocean has added a new fact to zoology in bringing up the living zoophyte from vast depths of the ocean, where it was supposed no animate creature could exist.

A challenge to the inventive genius of our country was thrown out through our columns, to construct a machine for sawing correctly the two sides of a marble pyramid, and soon afterwards it was accepted by scores of inventors, who had devised nearly as many different methods of accomplishing the object.

An engine actuated by the explosion of the gas which lights our streets, has been running in this city for the past two months; and another moved by the bi-sulphuret of carbon has been in operation for a somewhat longer period.

Turn to whatever hand we may, we find prominent time-marks of progress in the field of invention and discovery. Our country now ranks high for almost every kind of machinery, and for some kinds it stands without a peer. Only last week two English gentlemen, extensively engaged in agricultural pursuits in Australia, called upon us, and in the course of conversation, stated that it was the superiority of our agricultural machinery which had attracted them here as purchasers on a large scale. They had witnessed some of our implements at the World's Fair, in 1851, were pleased with them, and resolved then to visit our country at some future time. When they arrived here they found that the number and excellence of our machines far exceeded their expectations; this led them to prolong their visit, and greatly increase their purchases. They confessed that for all kinds of agricultural implements and machines, the United States were very far in advance of every country on the globe. This is a high tribute of praise, coming as it does from such a source.

Our inventors, mechanics, and men of genius have now gained a deservedly high reputation. This must not lull them to inactivity, but incite them to renewed efforts. Let us all begin this new year with a higher resolve to improve upon the past, so that those of us who may see its end, may be able to look back with some satisfaction upon the marked progress we have made in every good thing we found to do.

The Paddle Wheel and Screw.

The last number of the London *Artizan* contains an article on the performances of the *Himalaya*, screw steamer, and the *Atrato* feathering paddle wheel, in which the palm of superiority is awarded to the screw. Both steamers are of huge proportions, the former being 340 feet long, and the latter 318. They are built of iron, and have been running for about two years, exhibiting great speed. To produce an identical speed, the paddle wheel steamer absorbed 966 more horse power than the propeller. The *Himalaya* has direct acting engines, and its propeller only weighs ten tons. The paddle wheels of the *Atrato* weigh seventy tons, and her engines are side levers. It is our opinion that the propeller steamers have not yet had fair play in comparing them with paddle wheel steamers. Thus, it is well known that in two vessels of the same size—one a propeller, and the other a paddle wheel steamer—the custom has been, and now is, to put engines of about one-third less in the former than the latter. If the same power be applied to a propeller as to paddle wheels, and the surface of the screw to have the same velocity as that of the wheels combined, what would be the result? Why the speed of the two must be equal—all other things being equal—excepting loss by slip. Now what is the amount of slip attending each—paddle and screw? Well this has not yet been established, for it has been found to differ in different vessels of both classes. The slip of the *Himalaya* was found to be 15 per cent., by experiments, while that of the *Atrato* amounted to 23 per cent., thus

proving an immense economy of power by the use of the screw in this particular instance, but in other cases, the amount of slip has been against the screw. More light is still wanted on this all-important subject. Improvements to economize fuel in long sea voyages is one of the greatest, if not the greatest question of the present day, relating to international commerce.

Clarke's Railway Machinery.

Many works on railway engineering have been written and printed, but with the exception of the one bearing the above caption, they are all crude and unreliable. The author of it is a railway engineer, of great intelligence and scientific attainments. The publishers are Messrs. Blackie & Son, of London and Glasgow, Britain, and No. 117 Fulton st., this city (N. Y.)—a house pre-eminently distinguished for publishing the best of works on mechanism. We feel a pleasure in recommending solid reliable works of this kind to our engineers and machinists.

In 1849 the author—D. K. Clarke—commenced the work during an interval of leisure caused by *dull times*. In making investigations he found great and antagonistic differences existing in constructing and working the locomotives on different lines of railroad; and having applied for information to acknowledged authorities on railway mechanical questions, he found them holding very contrary opinions. This made him feel dissatisfied with public professional opinion in England; he saw there was no proper standard nor scientific data established. Being aware that positive experimental research and practical observation constituted the only basis on which a sound practical system of railway machinery can be constructed, he devoted himself unreservedly to the prosecution of railway mechanical engineering as a study, and entered upon an extensive course of investigation. He visited all the great railway stations of Great Britain, and acquired an intimate knowledge of their operations. He was assisted frankly by all the ablest engineers in England—especially by Robert Stephenson—and they freely furnished him with drawings of engines, tables of their performances, &c. Of the knowledge thus acquired he has made excellent use. The engravings of "rolling plant" (locomotive tenders and cars) as they call it in England, are numerous, large, and well executed. The defects of different styles are pointed out, and general principles (much wanted before) are laid down with precision and clearness. The lap of the valve; link motion; inside and outside cylinders; the action of steam; the capacity of the boiler, fire box, and heating surfaces, resistances to motion; in short, every question connected with railway engineering is discussed, old errors pointed out, and correct views given. The work has consumed four years in publication, and the author says it has cost him unremitting personal labor during the past six years. It is one of the most valuable, if not the most valuable contributions ever made to mechanical literature, and without it no mechanical or civil engineer can be intelligent and posted up in railway engineering.

The cost of the work in numbers is \$22 50—thirty numbers at 75 cents each. We could wish it were cheaper, for the sake of many mechanics who desire and need the work, but are unable to purchase it at so high a rate; but considering the number and beauty of the engravings, and the size of the volumes, it is cheap.

Sharpe's Rifle.

A great number of our papers have recently contained wonderful accounts of the above-named rifle, and some of our enterprising daily papers have exhibited a vast amount of Rip Van Winkle knowledge respecting it, by depicting it as a new and strange rifle, just brought out, and possessing the power of far greater range than any other fire-arm in the world. Those who wish to obtain correct information respecting this rifle will find it illustrated by three engravings on page 193, Vol. 5, *SCIENTIFIC AMERICAN*, and on page 196, (with Maynard's primer attached) in Vol. 6. The inventor is Christian Sharpe, who obtained his patent for it in 1848. It is an excellent breech-loading rifle; but we cannot perceive how its range can be greater than any other rifle.

Its accuracy depends entirely on the skill and care exercised in its construction; not, so far as we have been able to learn, on any principle not belonging to other rifles.—Old crack rifle shooters say that breech-loading rifles are not so good for accurate shooting as the common rifle with Clarke's patent muzzle. Sharpe's rifle, however, with its conical charge chamber, embraces the feature of the loading muzzle. Breech-loading rifles are, certainly, the most convenient kind, and will, no doubt, yet supersede the old rifles, at least, for rapid firing.

New Year's Resolves.—A Suggestion.

The commencement of a new year is a sort of starting point with almost everybody for the organization of new enterprises, the formation of new habits, and the correction of old failings.

If any of our readers are inclined to charge themselves with too much selfishness—with having too long lived without endeavors to benefit others around them—we hope they will begin the present year by trying to do better. We can suggest one direction in which any efforts in this respect will be sure to give satisfaction. Let them select from their circle of friends the names of such as would be likely to be benefited by a reading of the *SCIENTIFIC AMERICAN*, send the addresses to our office, with \$2 each for a year's subscription. New Year gifts of this kind would be, to most persons, not only acceptable, but in the highest degree beneficial. Many an individual has had occasion to be deeply thankful that the *SCIENTIFIC AMERICAN* was ever thrown in his way. Either he has been directly benefited by something observed in its pages, or it has set in motion new trains of thought, or inspired new impulses; the resultants have been seen in intellectual improvement, or in other successes of a substantial character. We venture to say that there is not a young man in the country but would be profited by a regular reading of such a work as our journal. Its tendency is to draw away the mind from unprofitable pleasures and frivolities, and attract it towards the consideration of subjects of a high, but truly interesting nature.

Those who are not already subscribers to the *SCIENTIFIC AMERICAN*, should now resolve to enroll their names; those who already enjoy the privilege should forthwith resolve to extend the same to all their friends.

Duty of Cornish Engines.

In our last number, is a communication from J. West, of Norristown, Pa., on the above subject, in which the duty of the Cornish engine is compared with the condensing steam engine, but the duty of the former, by the consumption of a bushel of coal is not given. The following will throw some light on the subject.

The number of pumping engines reported by *Lean's Engine Reporter* for the month of October is 17. They have consumed 1,189 tons of coal, and lifted 9,000,000 tons of water 10 fms. high. The average duty of the whole is, therefore, 45,000,000 lbs. lifted 1 foot high by the consumption of a bushel of coal, weighing 94 pounds.

The duty of Cornish engines increased from 26,400,000 lbs. in 1812, to 84,200,000 in 1838, according to Dr. Lardner.

Award of Prizes.

Our prizes, it will be remembered, were announced to be awarded on the first day of January, 1856. The present number of our journal, although bearing date January 5th, was put to press before the 1st inst., consequently the list of prize awards does not appear this week. We shall publish them next week. The large circulation of the *SCIENTIFIC AMERICAN* compels us to begin to print the edition several days previous to its actual issue.

We make this statement in order to relieve anxiety of any who might be expecting to see the names of the successful competitors published in this week's number.

Preserved Fruits.

To Mr. A. Cratey, of Brooklyn, are we indebted for some beautiful specimens of preserved strawberries and raspberries cured by a receipt which we are promised a copy of to publish in a few weeks.