

Scientific Museum.

On the Crank.

"Attend to the voice of Experience."

MESSRS EDITORS:—I have addressed this to you for publication, under protest, that I do not enter the arena of public discussion, but purely for the purpose of giving information, the publishing of which may primarily benefit many inventive mechanics.

You perhaps remember having an application from me the past summer, respecting a substitute for the crank. In your answer you stated the inherent defect of my substitute to be "the giving uniform leverage at all points of the revolution." This is not the only one: when you have done all, the pitman and crank will do the same, in the same cylinder with the same pressure. The formula to prove this is simple.

By the agency of a pair of dividers inscribe a circle of any magnitude; the centre is the position of the shaft, and any direct motive power may be supposed to act upon the circumference of the circle to cause it to revolve—the working length of cylinder is one half the circumferential distance in all cases, which may be represented by a line drawn in the position the cylinder would occupy. The question now arises, what length of crank have we relatively? Just one half the working length of the cylinder. Take the stroke of the crank by dividers, and placing one of their points again at the shaft centre, inscribe another circle: the inward circle gives us the direct continued mover, the outward (which mark is once and a half the diameter of the other, nearly) the crank—subdivide the circles by two lines, one drawn to intersect the two dead points, the other the positions of greatest power; divide these subdivisions by dots, touching different angles, and draw from these dots, lines to represent the different positions assumed by the connecting rod in a revolution; also dot the line touching the two points of extreme power into spaces which shall represent the leverage. Now wherever the pitman crosses this line in its various evolutions, its power is at once defined by the spaces of leverage which it encloses: there will be perceived an excess from a certain point to another certain point which exactly corresponds with the deficiency between others; so that the increased leverage is in all instances exactly the amount of the diminishment. The pitman, working as it does, is also compensating: there is evidently no loss from obliquity of action, as a diagram and, failing that, actual experiment will prove. Searching the works of Renwick, Lardner, Bourne, etc., for information, and not satisfied with the assertion of Messrs. Munn & Co., that my substitute was useless, I proceeded to test the question by steam; the result is the above. I now believe the exchanging the crank for any other medium of transferring reciprocating into rotary motion, one of the mechanical fallacies of the day. It is a trite saying that what we gain by experience, not too dearly purchased, is all the more valuable; and you are aware there are some who, whatever you assert, unless you prove as you go, are unbelieving still. I have been incited to make this communication, believing that many, more indigent investigators than myself, might thereby save time and expense, which would be vital to them; and by giving these facts publicity I conceive that you will be more instrumental than myself in conducting to the well being of a most worthy class of our community. I remain, respectfully, yours,

WM. B. TOBEY.

Syracuse, Nov. 23d, 1849.

Death from the Prick of a Pin.

Two weeks ago in Albany, N. Y., a young man named Henry Dodge run a pin into his arm just below the elbow, which was instantly extracted, and it was anticipated that nothing serious would occur from the slight accident, but on Tuesday his arm began to swell most alarmingly, from the effects of the poison and though medical attendance of the best character was secured immediately, the swelling extended to the belly, and on Wednesday he was no more.

History of Propellers and Steam Navigation.

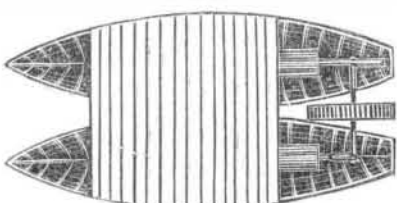
[Continued from page 88.]

EVANS, SYMINGTON, MILLER.

In 1686, Oliver Evans, of Philadelphia, a man of a most ingenious and constructive turn of mind for mechanics, proposed to navigate vessels by steam and paddle wheels. About this time a boat was run for a short time, by steam, between Philadelphia and Bordentown, but we have no means of ascertaining the nature and construction of the propelling parts. About the same time Dr. Franklin proposed to propel vessels by the immediate action of the steam upon water, but this was found to be utterly incompetent for the purpose. A Mr. Latrobe, a keen opponent of Evans, but a man celebrated as an engineer, unfortunately for his own future fame, wrote a work against the steam engine for impelling boats. It no doubt at the time retarded steam navigation in America, for, as a general thing, the man who can give a plausible reason against the introduction of a new invention, is held to be a Solomon, while the inventor is too often looked upon either as a knave or an enthusiast. It was the case with the first inventors of the steamboat.

In 1787, a Mr. Patrick Miller, of Dalswinton, in Scotland, took up the subject, and applied steam to propel a double vessel, with a wheel in the stern.

FIG. 7.



The steam engine for this boat was made and fitted up by a very ingenious mechanic, named Wm. Symington, and which is carefully preserved to the present day. The success of this boat was very gratifying, but it was only on a small scale, the cylinder being only four inches in diameter. In 1789, Mr. Symington again, under the direction of Mr. Miller, fitted up an engine on a double boat, 60 feet long. This boat, on the Forth and Clyde Canal, went at the rate of seven miles per hour, and was very promising as an experiment, but unfortunately the boat was too weak for the machinery, which was taken out, and Mr. Miller tried no more experiments. A work published by his son states that out of his private fortune Mr. Miller spent no less than \$150,000, making experiments, for which he never received in return a single cent. He was a patriot in mechanical science. It has always appeared strange to us how Mr. Miller came to embrace the idea of a double boat instead of a single one, but so far as it regards the successful and direct application of the piston by a crank, to drive a single paddle wheel, the evidence appears to be in favor of his claims, that is, of having put his invention into actual operation. Twelve years after Miller's last experiment, in 1801 and 1802, Symington induced Lord Dundas, a man of mechanical taste and experience, to build a steamboat, for dragging vessels, on the Forth and Clyde Canal. The engine for this new boat had a cylinder of 22 inches diameter, and four feet stroke. This was quite a large vessel, and it took in tow two sloops of 70 tons burden, and moved them with great ease through the canal, at the rate of 19 and a half miles in 6 hours—3½ miles per hour. This was a great feat, for the wind blew a strong head breeze all the time. This steamboat was also laid up, because the proprietors of the Canal supposed that the undulation of the water by the wheel would wash away the banks. It was made exactly upon upon the same plan as the former small one by Mr. Miller, (exhibited above.)

It was during the period of the building of this boat of Symington, that he received, as he states, a visit from Robert Fulton. He politely made himself known, and told Symington that as he was going to return to America soon but could not go away without seeing the steamboat operate, and would be happy to receive any information Mr. Symington chose to communicate, stating at the same time, that however advantageous the steamboat might be

to Great Britain, it would be of far greater benefit to America, with her broad, calm, and long rivers. This is direct testimony that Fulton had the steamboat in his mind before, or why should he go from England to Scotland to see this one. Every inventor, when he has any project in his head, likes to see and know about what is doing in the same line, but Symington was first in the field a bona fide steamboat builder. At the request of Fulton, Symington fired up and carried his guest four miles along the canal, and returned to the place of starting. Fulton took notes, and was very particular in his examinations. It is very singular that at this time, and for a long time afterwards, it was thought that steamboats were not capable of being employed except in placid waters. It is to be regretted that there was not enterprise enough in all Scotland, at this time, to encourage Symington to make his experiments on the river Clyde. We believe that we are not saying too much when we attribute the first real practical steamboat to this man. Our reasons are these:—He was very ingenious and was employed by Mr. Miller on this account; and he was a practical machinist and engineer—he could make and fit an engine as part of his trade, and he was a good tradesman. It is true that the steamboats with two paddle wheels, as they are now employed, are different from his, but he applied by the crank the direct action of the piston rod to revolve the wheel, and this simple and beautiful arrangement has been universally adopted in every steamboat built since that time, except in some screw propellers.

Platinum.

This metal, which in the state it is usually obtained, alloyed with palladium and rhodium joins the hardness of iron to the resistance of most chemical agents possessed by gold, has lately come into much use.

It is obtained from the ore brought from Spanish America, by the name of platina, the diminutive of plata, silver; and which is a kind of metallic sand. The platina is dissolved by the help of heat, in eight times its weight of a mixture of two parts of muriatic acid, at 22 deg. Baume, and one of nitric acid, at 35 deg. Baume. When the acid ceases to act, it is to be decanted, and fresh acid poured on the residuum, until all is taken up that the acid will dissolve, which generally requires four parcels of the acid. By this means, the iridium and osmium in platina is left in the residuum.

The acid solution is then evaporated until it crystallizes upon cooling, in order to drive off the excess of acid, and diluted with 10 times its weight of water. A solution of sal ammoniac, made as strong as possible, is poured into a solution of the platina, in a quantity beyond that necessary to throw down, all the sediment, which is an ammonia-muriate of platinum, is thrown upon a filter and well washed.

Platinum may be obtained directly from this ammonia muriate, by putting it into a crucible, and exposing it to the utmost degree of heat the chemist can command, observing to press down the mass with a button-headed iron rod, as the salt assumes the metallic form. When completely reduced, the regulus must be taken out of the crucible, and carefully forged; returning it frequently into the fire.

Another method, is to reduce the ammonia muriate by heat alone, without compression, and to melt the spongy mass of platinum alloyed with palladium and osmium thus obtained, with one-eighth its weight of black arsenic and casting it to thin plates, or small rods. This compound metal is then repeatedly heated and forged, until the arsenic is driven away.

Willis found, that platina might sometimes be melted upon a bed of charcoal in a crucible; and M. Boussingault has lately found that platinum always melts in a blast furnace, if the crucible is lined inside with a mixture of clay and charcoal. He thinks this fusion is owing to the admixture thus produced, of silicon with the platinum.

Platinum may be melted in small quantities not exceeding two ounces, by the blast of the oxy-hydrogen blow-pipe, and even kept in fusion for some time.

Platinum is used for crucibles, evaporating

dishes, and even alembics: it resists most of the acids, but is acted upon by caustic potasse, and several neutral salts. It may be welded like iron, and the proper solder for it is gold.

The solution of platina is used as a test to distinguish water containing potasse from that containing soda.

The concentration of oil of vitriol is now generally performed in platina stills, with leaden heads. Mr. Parkes had a still of this kind which held 35 gallons, and cost \$600.

LITERARY NOTICES.

PULPIT REPORTER.—A new religious journal has just made its appearance in this city, called the PULPIT REPORTER, which is devoted entirely to the publication of recent sermons by the most distinguished divines in the country, without regard to sect. The first number contains several splendid specimens of pulpit eloquence, among which we notice sermons by Edward N. Kirk, of Boston, Albert Barnes, of Philadelphia, George Bush of New York. A year's volume which costs only two dollars, is to contain over a hundred sermons. Just think what a literary curiosity such a volume will form—one hundred sermons from a hundred minds, such as Kirk, Barnes, Bush, Cox, Tyng, Hawkes, Beecher, Storrs, Williams, Welch, Bushnell, Hughes, Adams, Taylor, Chapin, and other kindred spirits.

NATIONAL BUSINESS DIRECTORY.—This is one of the most useful works extant for business men. It contains a complete list of all the Post towns, Post Offices, and Post Masters, in the United States, carefully revised and corrected from Government records, and the price for which it is sold (being only 25 cents) brings it once within the reach of all. There is scarcely a person in the country, whatever his business may be, who will not realize the amount of money paid for a work of this kind. To the business community it is a work of every day reference, and should meet with a large sale, as an encouragement to Mr. Pratt, the enterprising publisher. For sale, by H. Long, & Bro., 43 Ann St., Dewitt & Davenport, W. F. Burgess, and booksellers generally.

Any of our friends wishing one of the dictionaries, can enclose the amount to us.

THE WESTERN JOURNAL.—This valuable Journal for Nov., published by Tarver & Fisk, St. Louis, Mo., has been received. It is devoted to what is useful, and contains some of the most acute and profound articles on commerce, manufactures, education, &c., that are to be found in a magazine whatever.

FIRST LESSONS IN ARITHMETIC.—We have received from the publishers, A. S. Barnes & Co., this city, a copy of First Lessons in Arithmetic, designed for beginners, by Charles Davies, L. L. D., author of the elements of Algebra, Bourdon's Algebra, and many other mathematical works. This little volume, is the most simple and clear work for beginners that we have ever perused. It has been introduced into the Public Schools of Baltimore, and should be into all our schools.



O INVENTORS AND MECHANICS.

FIFTH YEAR OF

The Best
Mechanical Paper
IN THE WORLD!

A New Volume of the

SCIENTIFIC AMERICAN

is commenced about the 20th of Sept. each year, and is the best paper for Mechanics and inventors published in the world.

Each volume contains 416 pages of most valuable reading matter, and is illustrated with over

500 MECHANICAL ENGRAVINGS

of NEW INVENTIONS.

The Scientific American is a Weekly Journal of Art, Science and Mechanics, having for its object the advancement of the INTERESTS OF MECHANICS, MANUFACTURERS AND INVENTORS. Each number is illustrated with from five to TEN original ENGRAVINGS OF NEW MECHANICAL INVENTIONS, nearly all of the best inventions which are patented at Washington being illustrated in the Scientific American. It also contains a Weekly List of Patent Claims; notices of the progress of all Mechanical and Scientific Improvements; practical directions on the construction, management and use of all kinds of MACHINERY, TOOLS, &c. &c. This work is adapted to binding and the subscriber is possessed at the end of the year of a large volume of 416 pages illustrated with upwards of 500 mechanical engravings.

TERMS: Single subscription, \$2 a year in advance; \$1 for six months. Those who wish to subscribe have only to enclose the amount in a letter, directed to

MUNN & CO.

Publishers of the Scientific American, 128 Fulton street, New York. All Letters must be Post Paid.

Inducements for Clubbing.

5 copies for 6 months, \$4 10 copies for 12 months, \$15

5 " 12 " " \$8 20 " for 12 " " \$28

Southern and Western money taken at par for subscriptions. Post Office Stamps taken at their full value.

A PRESENT!

To any person who will send us Three Subscribers, we will present a copy of the PATENT LAWS OF THE UNITED STATES, together with all the information relative to PATENT OFFICE BUSINESS, including full directions for taking out Patents, method of making the Specifications, Claims, Drawings, Models, buying, selling, and transferring Patent Rights, &c.

N. B.—Subscribers will bear in mind that we employ no Agents to travel on our account.