

WEEKLY SUMMARY OF INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

SUGAR PROCESS.

This invention and improvement in furnaces for evaporating the juices of sugar cane consists in arranging in the front end of the furnace a vertical boiler which serves as a steam boiler to generate steam for the machinery employed in the crushing of the cane, and to construct this vertical boiler, so that the cane trash or bagasse may be fed down through the center and be supplied to the fire in a state fit for combustion, so that the bagasse may be used directly from the crushing mill as a suitable fuel. It further consists in combining with the vertical boiler a horizontal concentrating boiler of a peculiar shape, and surrounded with a water jacket, the water communicating with and receiving its heat from the vertical boiler, this boiler being divided into separate compartments by portable partitions. The patentee of this invention is Eugene Duchamp of St. Martinsville, La.

WATCHES & C.

This invention consists in controlling the active length of the pendulous spring or, as it is generally termed, the "hair spring" of a watch or other time-keeper, governed by a balance, by means of combined laminæ of brass and steel, or other metals which expand and contract differently with the same changes of temperature, so applied to that end of the said spring which has heretofore been fixed, as by their expansion and contraction to cause the said spring so be taken up through the curb pins, as it expands with an increased temperature, and to be let out as it contracts with a reduction of temperature. The credit of this contrivance is due to Henry B. James, of Trenton, N. J.

VISE AND SAW-SET.

The object of this invention is to combine a vise and saw-set in such a way that a very convenient tool will be obtained for facilitating the filing and setting both of circular and straight or reciprocating saws. The invention consists in attaching a saw-set to a slotted bar which is hinged to a vise and secured with an adjustable center; the parts being so arranged that when the vise is required to be used in order to hold the saw while being filed, the slotted bar is allowed to hang by the side of the vise out of the way, and when the saw-set is required for use, the bar of the saw-set is allowed to be secured in the vise in a proper working position. The inventor of this improvement is Norman Allen, of Unionville Conn.

TOBACCO PRESS.

This invention relates to certain machinery intended as a substitute for hand labor, in forming or rolling the lumps of tobacco; which result is obtained by means of a series of rollers arranged around a large drum or cylinder between which are interposed endless belts, and between these belts the tobacco is passed and compressed and formed into a compact continuous sheet, of the proper thickness, which when pressed passes out from between the rollers and is cut into plugs or lumps of the proper size, by rotary cutters. This patent was granted to Walter J. Van Horn, and William Alexander of Louisiana, Mo.

GUNPOWDER.

The nature of this invention consists in the employment of alcohol, either pure or slightly diluted, as a vehicle for mixing with and combining the separate dry ingredients of which the gunpowder is composed. V. L. Maxwell, of Wilkesbarre, Pa., is the inventor.

AMERICAN SHIPS AND SHIPBUILDING.

A lecture on this important and truly interesting subject was delivered at Clinton Hall, this city, on the evening of the 29th ult., by the Hon. John McLeod Murphy, senator-elect to the State Legislature. He said that the salient points of American-built ships were safety, capacity and speed. The models of American-built vessels had always challenged the admiration of the world, while for speed they were unrivaled. He passed a high eulogium on George Steers, one of whose plans in shipbuilding was to fashion a vessel in such a manner that in case of being wrecked she would go to the beach with head on, and be saved from breaking to pieces.

Alluding to ocean steamers, Mr. Murphy said that in June, 1819, the steamer *Savannah* successfully demon-

strated the possibility of crossing the ocean by steam. She was built by Hickett & Crockett, at the Novelty Iron Works, and differed much from steamships now-a-days, her wheels being unprotected by guards.

Up to 1816 a wooden model of a ship was unknown in this city, all vessels being built from designs on paper. The first model was made by Christian Burke, with the assistance of Dr. Vincent. To Henry Eckford, the father of naval architecture in this country, we are indebted for that style of shipbuilding which is purely American. To Eckford and Fulton America owes a debt never to be paid. Mr. Murphy proceeded to give a sketch of Eckford's life, from the time that he worked at a boat-builder's shop, in Dover-street, at \$1.25 a day, till he died in Constantinople, in 1832. He gave to this country that naval supremacy which is acknowledged over the civilized world. In the war of 1812, he contracted with the United States government to construct war ships for the Lakes, and his fame is thus linked with that of Perry and Macdonald.

The first steamship built in this country was the *Claremont*, in 1807, by Charles Brown. The speed of steamships in 1812 and 1813 may be judged of from captions in the newspapers. Here is one of them:—"Twenty-four hours later from Albany, with news of Gen. Scott's proceedings. Very late intelligence." Christian Burke's first essay in New York was a pilot boat, and to him is owing the race of that useful class of vessels. Our ferry boats we owe to R. L. Stevens and his cotemporaries. The city of Brooklyn, since 1824, has been built up by the ferry boats. It was only a village before. Its importance has been made by the application of steam to ferry boats. It was not unreasonable, the lecturer thought, to predict that boats would soon be built that would run 25 miles an hour.

Apropos of the Great Eastern, Mr. Murphy considered her the saddest failure of all commercial and mechanical speculations, and he was sorry she was so. He had reason to know that our mechanics mingled their condemnation of her with very great regret. There were many reasons why she must prove a failure. The time allowed for her in port would not be sufficient for her to take in freight and get a complement of passengers. A smaller vessel would make the voyage while she was filling. She is also a failure in her model. Her draft of water is ten feet too many. Each cubic foot of water would strike her sides with a resistance of sixty-four pounds. She is deficient in strength, and cannot work the side wheels and screw with equal speed. That "irrepressible conflict" opened up some interesting mechanical questions regarding the possible remedy. If anything could be done, it would be the taking away the screw, and applying the whole steam power to the wheels alone, if, indeed, the boilers were strong enough to resist the pressure of the accumulated steam. But there were still radical faults in her model which defied all correction. A larger ship would yet be built in this country, but her keel would not be laid till it was clearly shown that she could be made to pay.

Iron steamships are not, it would appear, favorites with Mr. Murphy. While usually we consume less coal in our steamships than either England or France do in theirs, the outfit of our vessels cannot compare with that of England. In that country the officers are retained in one ship, so that they get a perfect familiarity with her; with us, too often, captain and crew come on board together.

The lecturer glowingly eulogized the artisans and mechanics of our ship-yards. There may be found there men of intelligence, physical endurance and steady habits, who must challenge admiration. Nor were the merchants of the country to be forgotten. Their patriotism and liberality in encouraging shipbuilding were great. It was to be regretted that the government of the United States had not established a school of instruction for youth in naval architecture—an institution which should, in its devotion to art, be free from all political influences. Nobody who loves art would insult the artist of the "Heart of the Andes," or of the "Greek Slave," by asking what ticket they voted, or to what political body they belonged.

Mr. Murphy gave an interesting account of his early connection with the sea, his love of the works of Falconer, Dibdin and Capt. Basil Hall; and after the recitation of a nautical poem, he concluded a lecture which was listened to with great interest, and which was continually interrupted with great applause.

MANUFACTURE OF MAMMOTH CANNON.

A cannon weighing 35 tons was successfully cast at the Fort Pitt foundry, Pittsburgh, on the 23d ult., under the superintendence of Lieut. Rodman, of the Ordnance Department. This is stated to be the largest cannon in the world. The casting is fifty inches in diameter, and nineteen feet five inches long. Seventy-eight thousand pounds of metal were melted for it in three reverberatory air furnaces, within four and a half hours after the fires were lit. The furnaces were tapped in succession, and the iron run in separate channels into a common reservoir, from which it passed into the mold—the latter being filled within twenty-one minutes after the first tap. The mold was a ponderous structure, and was placed vertically in a pit prepared for the purpose.

The gun has been named the "Floyd," in compliment to the Secretary of War, whose zeal for the improvement of artillery prompted this laudable experiment in gunnery. The model of the gun was designed by Lieut. Rodman, and made under his supervision from a plan of which he is the inventor, for casting guns hollow, and cooling them by circulating a stream of water through the interior of the core. The cold water enters at the top, passes down through a pipe in the center of the core, and is discharged at the bottom of the hollow part, and then, passing up through the core, becomes heated and is discharged at the top. It circulates a constant stream at the rate of about forty gallons per minute, and is continued until the casting becomes cool.

The drawings, patterns and computations were made by Mr. N. R. Wade, junior member of the firm of Knapp, Rudd & Co. The molding and casting were conducted by Mr. J. Kaye, and Joseph Marshall melted the iron. The ease, regularity and thorough success with which the different processes were conducted, were astonishing, and sufficiently manifested the extraordinary practical skill and judgment of all concerned in the operation.

PRACTICAL BENEFITS OF THE COOPER INSTITUTE.

Since November 1, 1859, the first course of free instruction has been in progress at the Cooper Union, this city. About 2,000 pupils now participate in the educational advantages of the institution, 420 of whom are in the drawing-classes; 300 in the vocal music classes; 300 in the chemistry class; 200 in that pursuing mathematics, and 150 in that which devotes its energies to natural philosophy. The School of Design for women has 120 pupils, but a very small proportion of whom (only 12 out of 120) pay for tuition. These are the only ones in the building, moreover, who pay anything. There are lectures or classes every evening in the week, free to all, upon application with certificate of good moral character. The free reading-room is one of the largest in the country, including a great number of periodicals, sent free of charge, besides a subscription-list for publications of this class, amounting to \$1,200 per annum. All the leading foreign and domestic journals are received. The picture-gallery contains a large number of paintings by the old masters, including an original Raphael. A large portion of the Bryan collection is temporarily in the gallery. The expenses of the institution are partially maintained by rents of offices and stores. The revenue from this source is, however, smaller than it should be, owing to the unfinished state of Tompkins Market, and the uncouth sheds temporarily erected in its stead. Mr. Cooper has authorized the trustees to draw upon him for \$10,000, to make up the deficit in the first year's receipts.

EXTRAORDINARY TELEGRAPHING.—There were sent on Tuesday, 28th ult., over the wires of the Atlantic and Ohio telegraph (Morse) lines, extending between Philadelphia and Pittsburgh, five hundred and seventy-eight private despatches, over five thousand words of news for the Associated Press, and an entire copy of the President's Message, containing over fifteen thousand words, to the Pittsburgh *Post*, and all during the regular business hours of the day. The President's Message was transmitted, on two wires, in five hours and fifteen minutes. Two thousand and eighty-three words were transmitted by one operator—Mr. Zeigler—in an hour; Mr. Fleming, of Pittsburgh, taking it down by the "tick."—*Philadelphia Ledger*.

WATER flowing in streams, with a velocity of 3 feet per second, moves stones the size of a hen's egg.