shoulder, encircling the stud, a spiral spring, *s*, is placed in the socket, which forces in the stud, but, at the same time, allows it to yield to pressure, causing it to stand up above the face of the type bed at a point exactly under the upper part of the band, *e*. Every time the type bed and platten approach one another, the presser comes in contact with the band and presses it up against the under side of the platten or a plate secured to it, and thus holds the band so that it and the sheet must move at the same speed as the type bed and platten. If the speed of the cylinder, U, U′, which is adjusted as nearly as possible to the speed of the type bed and platten, should be too slow, the manner in which the pulley, V, acts on U, admits of its being moved faster, but if it should go too fast, the speed of the barrel and of the cylinder, U′, will be temporarily retarded.

Operation.—Rotary motion is given to the driving pulley, and the cog-wheel, L, in the direction of the arrow (figure 2); this cog wheel gives motion to the wheels, F F, which, with their shafts, and the cranks upon them, revolve in the directions pointed out by the arrows shown near their peripheries. This gives motion to the type bed and platten. These, by the positions in which the cranks are arranged, always move in the same direction longitudinally or horizontally. The type bed and platten are at a distance apart, but they meet during the revolution of the cranks so as to make the impression on the paper. Just before the platten reaches its highest position, it comes in contact with the bar, *p*, on the barrel, P, pushing it upwards and moving it to the position shown in figure 3, where the inking roller is supposed to have moved forward across the form, and the platten is about to descend and release the bar, *p*, and leave the barrel, P, free to be acted upon by the spring, *t*, and cord, *u*, which throws back the inking roller to the distributing roller. This motion takes place previous to every meeting of the type bed and platten, and gives the proper quantity of ink to the type. If the speed of the cylinders, U U′, be properly regulated, the paper must travel at the proper speed, but in case the driving band should slip, it is necessary to insure its motion by the spring presser W. The paper is cut off into proper sheets after it is printed, by a cutting apparatus at the end of the press; such a contrivance is not new in printing presses.

In connection with printing one side of the paper, a duplicate arrangement of the same machinery can be made to print both sides at one continuous operation. The great object of this press is the arrangement of machinery for rapid motion, yet to make the impression on a plane surface, to produce the best impression—a combination of the rotary and reciprocating printing press, Mr. Dodge has ingeniously accomplished his object.

[Special Correspondence of the Scientific American.

London, June 12th 1851.

Next to the Great Exhibition building itself, the greatest novelty in London, is Mr. Wyld's great model globe. The English appear to indulge in gigantic projects. This globe has a surface of more than 11,000 square feet, and is a great novelty in geographical science.

The diversities of the earth's surface are modelled with minute accuracy, the scale being one inch to a mile vertically, and one inch to ten miles horizontally, the diameter being 60 feet. The spectator is supposed to be in the interior of the earth, and to look up to its concave surface. The different countries are tinted, so as to represent the truth of nature as nearly as possible, and no writing or inscription of any kind disfigures the general appearance of the gigantic model. The visitor enters the model through the South Pacific Ocean, and the southern extremity of Africa is the first land of which he gets a view. Four galleries, one above the other, enable the visitor to examine closely every portion of the model. It is intended to supply the visitors with a kind of index to the model, by arranging the index maps in the different galleries. At present, the shape and relation of the different parts of the model alone explain the identity of the different countries. So exact and minutely accurate, however, is the delineation, that the visitor, moderately educated in geographical science, can see at once the places for which he is in search.

"That nothing may tend to divert the attention from the natural appearances which the earth's surface presents, there is no writing upon the model. The sea is colored blue, and the land of as natural a tint as possible. The great model teaches what no man can teach—the earth's form as a whole, its general aspect, the relative quantities and positions of its several parts, the bearings of its hills, the flow of its great waters, and the seats of its rich dales and its barren wastes.

The top of the globe is made the north pole, and the bottom the south pole, without regard being paid to what is known as the inclination of the ecliptic."

Mr. Wyld's work is something more than a mere exhibition for amusement. It is probably the most useful of all the metropolitan exhibitions. The mere mechanical skill which could build out of thousands of plaster blocks a complete and accurate model of the earth's surface, is no ordinary triumph.

There is one American now in London who is astonishing the natives, this is Mr. Hobbs, the great Lock Man, of New York, who is an exhibitor here, all the great locks—the supposed unpickable ones—yield to his Yankee genius, like the door of the robbers' cave to Ali Babi's "*open sesame.*" His magic word is a crooked Yankee nail, which he carries in his vest pocket, and with it "he picked the heretofore supposed unpickable Chubb lock, which laughed at all the English locksmiths and rogues. It is the reliance of bankers, and secures the archives of the government. He opened the chest in just fifteen minutes, and he proposes to try his hand at several other locks, to the successful opening of which large rewards are offered by the inventors.

One small but good invention is exhibited in the American Department. It is a model key with a revolving end. The object of the invention is to give to housekeepers all the safety against lock-picking which they can derive from having the key inserted in the hole, and there left to prevent the insertion of any burglar's implement, of which it is well known there are a great variety adapted to the different descriptions of locks. The only effect which the burglar can produce on it is to turn round the revolving end.

It is a New York invention, and was patentented, I have been informed a short time ago.

One of the most singular inventions exhibited is the model of a man by Count Danin. It represents the figure of a man five feet high, in the proportion of the Apollo, and from that size the figure can be increased in all its compartments to six feet eight inches. It is intended to facilitate the clothing of an army; and it is so ingenious that the Emperor pardoned and recalled Count Danin, who is a Pole, on seeing this result of many years' labor. The number of pieces composing the model is 700.

Among the gems of sculpture is the 'Veiled Vesta.' It represents a young and exquisitely formed girl, kneeling and offering her oblation of the sacred fire. Her face is veiled, but every feature is as distinctly visible as it were through the folds which cover her face.

Excelsior.

Curious Discovery in Bulgaria.

A very curious discovery has just been made in the province of Bulgaria, in Turkey. Some Greek workmen, in digging near the village of Rahmanileah and the town of Hadzah, found a large table of grey colored marble; they removed it, and found one beneath exactly similar; having removed that also, they saw a great number of objects shining like gold and sliver. They hastened to the captain of the district, and that functionary, assisted by two ecclesiastics, proceeded to make an examination. They found a skeleton of large stature, with a copper helmet on his head, surrounded by a thin crown of gold; the hands and arms up to the elbows were stained with something of a bronze color; in the right hand was a copper chain, with an incense-box of the same metal, covered with verdigris, on the third finger of the left hand was a gold ring, with the figures in Roman characters, 966. By the side of the skeleton were three cups in silver, very brilliant, and 26 cups in iron, very rusty but bearing traces of having been gilded; there were also an immense number of nails, and about 500 arrows, of which the wood was rotten and the points rusty. The skeleton and the different articles were carefully packed up, and sent to Adrianople for examination.

Passages of the Atlantic Mail Steamships from Liverpool to New York, from April 3, to June 1, 1851.

Africa, (B), arrived Thursday, 10th April, at 7 A. M. Left Liverpool 29th March at M. Passage, 11 days 19 hours.

Pacific (A), arrived Saturday, April 19, at 10½ A. M. Left Liverpool on the 9th, at 2 P. M. Passage 9 days 21½ hours.

Asia (B), arrived on Wednesday, April 23, at 10½ A. M. Left Liverpool on the 12th at 5½ P. M. Passage, 10 days 17 hours.

Europa (B.), arrived on Thursday, 7th May, at 7 A. M. Left Liverpool 26th April at M. Passage 11 days 17 hours.

Arctic (A.), arrived Sunday, 11th May, at 7½ A. M. Left Liverpool May 3rd, at 10½ A. M. Passage, 10 days 19 hours.

Africa (B.), arrived Wednesday at 9 A. M., 23rd May. Left Liverpool Saturday, May 12, at 3 P. M. Passage, 10 days 17 hours.

Baltic, (A.), arrived May 25, at 7 P. M. Left Liverpool on the 14th, at M. Passage, 10 days 7 hours.

Asia (B.), arrived on Wednesday, June 4, at 8 A. M. Left Liverpool May 24, at 3½ P. M. Passage 10 days 16½ hours.

Pacific (A.), arrived Saturday, June 7, at M. Left Liverpool Wednesday, 28th May, at 10 A. M. Passage 10 days 2 hours.

Niagara (B.), arrived on Friday, May 20 at 7½ A. M. Left Liverpool on Saturday, the 7th, at 1 P. M. Passage 12 days 16½ hours.

Arctic (A.), arrived on Sunday, June 22, at 2 P. M. Left Liverpool on Wednesday, the 11th, at 9 A. M. Passage 11 days 4 hours.

Extraordinary Effects of Lightning.

A late French newspaper relates a marvellous incident, which is said have occurred during a thunder-storm in the interior department of France. A barn, in which were two goats, was struck by the lightning, but not burnt. After the shower, a woman who had been accustomed to feed the goats, went to the barn, and perceiving that the animals were entirely motionless, approached and touched them, when to her great astonishment and alarm they fell and crumbled to pieces, exhibiting nothing but a mass of cinders.

The Sea Diminishing.

Lieut. Wm. D. Porter, of the navy, has an interesting communication in the Intelligencer, in which he undertakes to show that all the phenomena of change in the ocean line of seacoast, and appearance of rocks above the water, which have been observed and commented on from time to time, are caused by a constant diminution of the waters of the ocean; and that a process is at all times going on by which the substances, held in solution in the ocean waters are converted into solids.—[Ex.

[This will not account for the disappearance of solids—the usurpation by the sea of what was once dry land, as on the coast of England.

A discovery has just been made at Hermiones, in the Peloponnesus, of a certain spring of water which, when mixed with oil, becomes at once a kind of soap. A sample has been submitted to chemical analysis.—[Exchange.

[There are plenty of such springs in the Rocky Mountains. The waters are alkaline. An alkali and oil form soap.

A system of banking is discovered to have prevailed in Babylon at least seven or eight hundred years before the Christain era.—[Exchange.

How and where was it found out friend ?

Deep Sea Soundings.

An act of Congress authorizes the vessels of the navy to co-perate with the sciontific Lieutenant Maury, in procuring materials for his investigations into the phenomena of the "Great Deep." An order of the Chief of the Bureau of Ordinance requires the commanders of our public cruisers to get a deep sea sounding whenever it is calm. Heretofore this had been a difficult object. The difficulty was in getting a line long enough, and in knowing when the plummet had reached the bottom.

Recourse had been had by other navies to wire of great length and tenuity, and the greatest depth ever known to have been reached, before the subject was taken up here, was the sounding, by an officer of the English navy, in 4,000 fathoms, which was by no means satisfactory. Lieut. Walsh, in the United States schooner Taney, has reported a sounding without bottom, more than a mile deeper than this.

Instead of costly implements used for sounding the depths of the ocean, our vessels are simply supplied with twine, to which they attach a weight, and when the weight ceases to sink they know it is on the bottom; and thus the depths of the ocean, in the deepest parts, may, without trouble or inconvenience, be ascertained in every calm of a few minutes' continuance.

With this simple contrivance the "Albany," Captain Platt, has run a line of deep sea soundings across the Gulf of Mexico, from Tampico to the Straits of Florida.

The basin which holds the waters of this Gulf has thus been ascertained to be about a mile deep, and the Gulf stream in the Florida Pass about 3,000 feet deep.

Capt. Barron of the "John Adams" has been sounding the Atlantic Basin, between the Capes of Virginia and the Island of Madeira, belonging to Portugal. He got bottom with a line of 5,500 fathoms, the deepest, and 1,040 fathoms the shallowest.

Men of science will recognise in these results some of the most interesting and valuable physical discoveries of the day. They reflect the highest credit upon our navy and those who planned and set on foot these simple and beautiful arrangements, which have cleared away the difficulties with which all have found themselves beset who heretofore have undertaken to fathom the sea at great depths.

We hope these facts will strike the gilt gingerbread off the learned *pundits* in this city, who two years ago held a controversy with us, and took the position that a weight could not sink below a certain depth in the ocean—that there was a place where the waters were denser than metal, and that stones and dead men's bones rested in that strata between the bottom and surface, like the fabled coffin of Mahomet in another element.

Purifying Water.

Mr. Editor—I have many times seen in papers, and I think in the Scientific American, that a spoonful of powdered alum stirred in a barrel of water, will cleanse it; I have tried the experiment many times, and always find that soft water is made hard, and hard water, (limestone water, as all waters are in western Vermont,) is but little more soft. Will some of your large number of intelligent correspondents tell us how to make water clean as well as clear? The experiment succeeds admirably in rendering water transparent, and produces a large precipitate of solid substances, but yet leaves in solution something which makes the water unfit for use. H. A. S.

Middlebury, Vt., June 20, 1851.

[The alum can have no effect in rendering lime water soft, for it produces the effect spoken of, it being a peculiar salt, partaking of acidulous astringent qualities. Oxalic acid is the best substance for precipitating lime in water, but we deprecate its employment for that purpose. For domestic use, the only safe mode of purifying water is by filtration.

The thermometer has been ranging above 90° for some days past. The price of tallow as a consequence has advanced.

The gold discoveries in Maine have turned out to be mere shams.