THE LONDON EXHIBITION.

On another page will be found a letter from our special correspondent, Mr. J. E. Holmes, about the London Exhibition. The following courteous and candid extracts are from the London *Mechanics' Magazine*. They corroborate the modest but conscientious views of our special correspondent on the utilitarian character of the articles in

THE AMERICAN DEPARTMENT.

The display of American products at the great Exhibition would, no doubt, have been greater but for the present unhappy conflict in that country. As it is, the American court is well worth a visit, and deserves a carcful study. Scientific men will recognize in the varied and useful inventions which are there exhibited simplicity of construction and beauty of workmanship, and the unscientific will see much to admire in the appliances by which labor is made easy and toil pleasant. American "notions" are intensely utilitarian. Increased production at the smallest expense of labor is their maxim. Many of the machines here exhibited are adapted to field and farm labor, and it is no disparagement of our eminent agricultural engineers to say, that in regard to these implements the Americans have been able to hold their own, and maintain their position against all competitors.

On entering the court, which is at the southeast corner of the building, Wood's mowing and reaping machines occupy a prominent position. These are exhibited by Mr. Cranston, of King William street, and have attained a large sale in England as well as in America. During the last eight years 30,000 of them have been manufactured, 2,500 of which have been sold in England. It is at present set up as a reaper, but can be easily changed to a mower by removing the reel and platform. A self-acting rake can be adjusted to the reaper, which will deliver the cut grain in bundles at the side.

Here is also the mowing machine which gained the first prize at the Royal Agricultural Society's show at Leeds, last year. Apart from the ingenious construction of this machine, it really merits inspection for the beautiful style and finish of its workmanship. Notwithstanding the sneers of some finical and fastidious critics about this Exhibition being a huge puff and a vast advertising mart, we rather take it to be a school where all may learn much from each other. Our artizans and mechanics will get many a useful hint by comparing the workmanship of the various articles exhibited, and may emulate the excellence displayed by others without anything derogatory to themselves. These and other kindred machines are producing a wondrous change on the slow, rude forms of agricultural labor. The application of science to farming is making the land more productive.

Let the visitor walk straight across from these machines and inspect some hay and manure forks manufactured by Batcheller and Sons, and exhibited by Messrs. Smith, of Doncaster. These forks look more like elegant toys than implements for laborious work. They are made of the best American cast-steel, with two, three and four oval prongs, and are remarkable for lightness, strength and elasticity. They are about half the weight of an ordinary English fork, maintain their perfect shape till worn out, and enable the laborer to do his work with ease and rapidity. They are the most perfect agricultural instruments we ever saw.

In a case adjoining these are exhibited coopers' axes, chopping axes, and adzes, from the Douglas Axe Company, Massachusetts. These tools are of beautiful shape and finish; the steel is of the finest temper, and as specimens of American cutlery will, we think, be unsurpassed by anything of the kind in the Exhibition.

Drake's boring and spacing machine is exhibited by Mr. Wemple, of Albany, N. Y., and is a novel and very useful invention for boring blind stiles, or any other wood-work where a series of holes are required at equal distances apart, doing the work with great accuracy, and saving the labor of spacing and laying it out. The machine, though having the appearance of being complicated, is really very simple and effective, doing its work, which otherwise would be tedious, with great rapidity and precision.

On passing Ward's ocean marine telegraph we found him in the midst of a circle of inquiring visitors who were taking a lively interest in his invention.

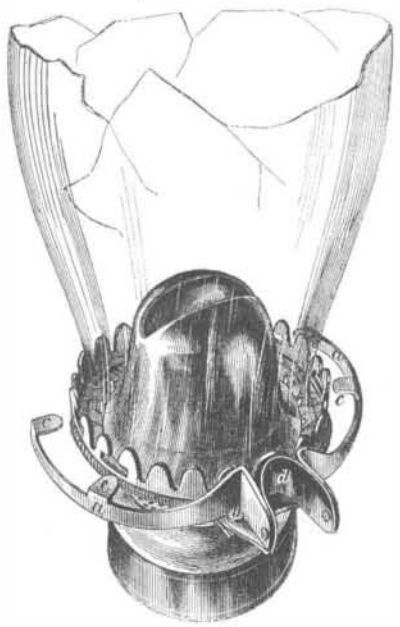
Mr. Beardsley, of Otsego county, N. Y., exhibits two machines of a very American-like appearance, which have attracted considerable attention in that country. The hay elevator is intended for unloading hay into the barn or on to the stack. The two arms move on a pivot, and are made to clutch the hay by tightening the chain. A trip hook is put into the ring of the chain, or to unload by horse power, a sheaved block is attached to the ridge and another on to the floor where the horses are hitched, and as they walk off on to the ground, up goes the fork with one-third of a wagon-load at once.

The earth elevator, by the same inventor, is on a similar principle. It is meant chiefly for drain cutting and ditching, and has the same object in view, rapid working and the saving of hard labor. For making embankments or draining on a large scale we think the machine merits attention.

We shall return again to this court, and would recommend those to visit it who are looking for the useful more than for the showy. There are some things here which will yet make themselves known in the old world as well as the new.

JACOBS'S MODE OF SECURING CHIMNEYS TO LAMPS.

The immense production of coal and rock oils has



so reduced the price as to lead to their extensive use in place of other substances for generating light, and as they are burned entirely in lamps, an enormous demand for these has sprung up; leading manufacturers and others to put forth great efforts to improve the article. Already many patents have been taken, and some of the inventions have proved exceedingly profitable. The most profitable of any that has come to our knowledge is a plan for holding the chimney in place by a spring, which not only facilitated the taking off and putting on of the chimney, but by the yielding of the spring prevented the chimney from being broken as it expands by the heat. One of the officers of a lamp manufacturing company told us that their company were paying the inventor $300 per month for the right to use this little improvement. The plan which we here illustrate holds the chimney by a spring, but by peculiar, novel and convenient arrangements, which enable the chimney to be removed or replaced with great facility. It will be readily understood by a glance at the engravings almost without a description.

Two fingers, *a a*, are secured to the lamp top by pivots, *b*, which enter ears formed for the purpose upon the lamp top. The fingers, *a a*, have projections, *c c*, formed upon their inner edges, to pass through slots in the lamp top and catch over the rim upon the lower edge of the chimney. The short arms of the fingers, *a a*, which extend outward from the pivots are flattened so as to be readily grasped by the thumb and finger, and they are pressed apart by a curved spring, *d*, which forces the fingers inward, carrying the projections, *c c*, through their slots and securing the chimney in its place. When it is desired to remove the chimney, the outer arms of the fingers, *a a*, are grasped by the thumb and finger of the operator and with the other hand the chimney is taken off. The chimney can thus be kept in a vertical position, preventing it from being soiled by the smoke or broken by the heat of the flame.

The patent for this invention was granted May 13, 1862, and further information in relation to it may be obtained by addressing the inventor, Thomas T. Jacobs, at Mount Carroll, Ill.

ADAMAS---SOAPSTONE.

We have had several inquiries recently in relation to the supposed new material which has received the name of Adamas, and respecting which we published some information, taken from the London *Artizan*, on page 340 of our present volume. This substance is simply soapstone under a new name. The *Artizan* states that it has lately come into very general use for gas burners. On page 124, Vol. XIII, SCIENTIFIC AMERICAN (old series), we gave a full description of the mode of making such gas burners. The *Artizan*, however, does describe a new application of it, namely, for journal boxes of machinery as a substitute for Babbitt metal. As very many of our present readers have not access to the former volume containing the description of the mode of treating soapstone and making it into gas burners and taps, we republish it because the information is very useful.

The soapstone is first cut into small slabs of such a size as will accord with the articles that are to be made of it. These small slabs are now put into iron boxes hermetically sealed, and placed in a low fire where they are heated very gently at first and then gradually raised to a red heat. They are now cooled very slowly by withdrawing the iron boxes from the fire and covering them with dry warm sand or ashes from the fire. (An annealing oven will answer the same purpose.) When perfectly cool these annealed soapstone slabs can easily be turned into the desired form in a lathe, after which they are boiled in oil until they acquire a deep brown color. When taken out of the oil and dried they take a beautiful polish by simply rubbing them with a woolen rag. The inventor of these gas burners is Mr. Schwartz, of Neuremberg, Germany. They were recommended by Prof. Liebig, and by the SCIENTIFIC AMERICAN, five years ago.

The London *Artizan* states that Mr. Leoni makes his gas burners, &c., of soapstone dust, molded into the desired form, then annealed. No description of the method of giving the dust cohesion has been published. Soapstone dust has been used to some extent for twenty years as an anti-friction agent in journal boxes, and soapstone rollers are used in the dressing frames of New England cotton factories.

A SAFE GUNPOWDER.

G. B. Wiesling, Esq., a civil engineer, at present residing at Van Nest Gap, in New Jersey, has invented a gunpowder of novel composition, which possesses some extraordinary and valuable properties. If ignited in an unconfined mass or in an open keg, it burns without an explosion, while if thoroughly secured by tamping, it explodes with as much force as ordinary gunpowder.

Mr. Wiesling has used this powder extensively in his large operations in the Van Nest Gap tunnel on the Warren Railroad—he being one of the contractors for this work, and having had the practical direction of it during the eight years in which it has been prosecuted.

A patent for the powder has been applied for through the Scientific American Patent Agency, and has been allowed by the Department, though the papers are not yet issued. By varying the proportions of the ingredients a powder is produced which is explosive under all circumstances, and this property may be varied to any extent desired. Besides its safety, the inventor says that this powder may be sold for half a dollar a keg less than ordinary blasting powder.

KNOWLEDGE is power, saith the familiar adage. Let him who would possess both knowledge and power become a constant, faithful reader of the SCIENTIFIC AMERICAN. This will infallibly enlighten the intellect, quicken the perceptions, and inspire a new interest in all that is good and useful. Remember, that a new volume commences next week, and do not fail to send in your name as a subscriber.

Improved Pitch Square.

It is only by long experience, and by having the attention directed to the subject, that any person, either performing work or having the direction of it, is able to appreciate the large proportion of time consumed in planning, measuring, and laying out. Instruments, therefore, which indicate the exact position for a cut or a hole, are valuable, not only from securing a greater accuracy in the work, but also from the saving of time which results from their use.

The accompanying engravings represent a simple implement for carpenters' and joiners' use, intended to facilitate the cutting of rafters, the laying out of stairs and many other operations. It consists merely in the combination of a carpenters' square with a graduated straight edge.

Fig. 1 is a flat view of the implement and Fig. 2 a view edgewise. A is a carpenters' square made of metal in the ordinary form with the outer edges graduated in inches and sixteenths, and the inner edges in inches and twelfths. The straight edge or stock, B, is in two parts, one upon each side of the square as shown in Fig. 2. These two parts of the stock are drawn together —grasping the square— by means of the bolts, C C, which are provided with nuts, D, having milled heads; dowel pins, *e e*, keep the parts in position. The bolts, C, pass through long slots, *c c*, in the square and *f f*, in the stock, allowing the relative position of those two piece to be varied.

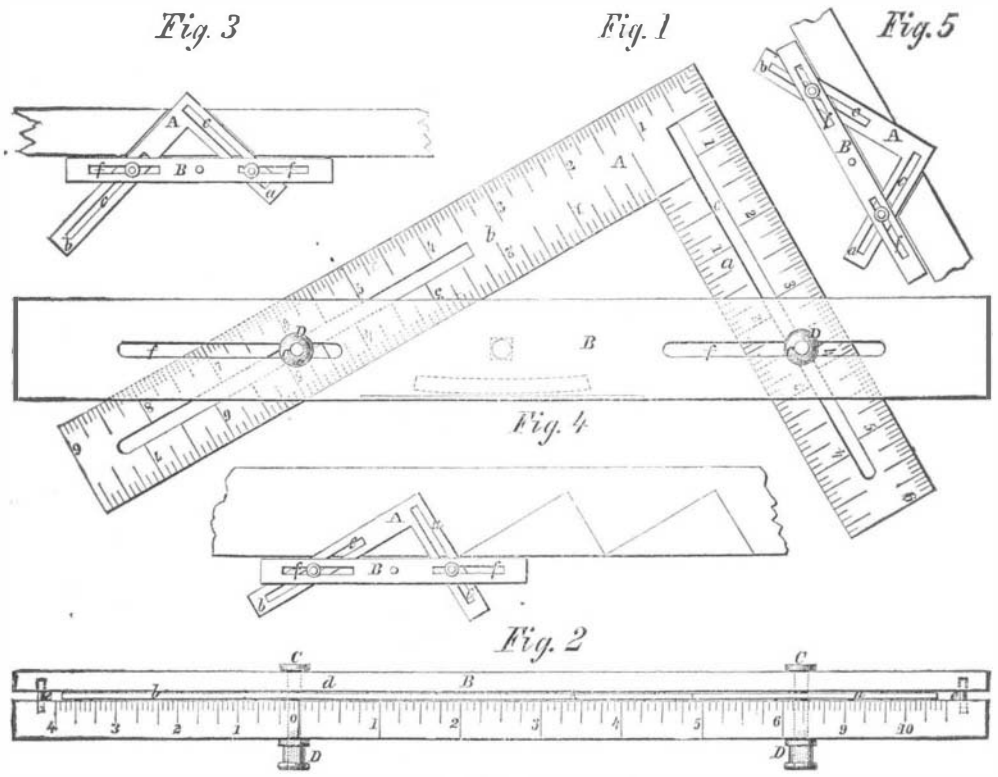
The outer edge of the stock is graduated in inches as shown in Fig. 2, the inches from ● to 6 inclusive being subdivided into twelfths, and at each side of these points into sixteenths.

It would be impossible to give directions for the use of this implement in the great number of cases in which it may be employed, but a few of the more important will be sufficient to suggest the others as occasions arise. If it is desired to obtain the length of a rafter for a roof of which the span is 32 feet and the perpendicular hight 16 feet; let one-fourth of an inch on the scale represent a foot in the roof; set the short arm of the square with the fourth inch—equal to 16 quarters of an inch for the 16 feet perpendicular hight—even with the side of the stock; and bring the fourth division on the longer arm of the square—equal to 16 feet, one-half of the span—even with zero on the stock; then will the space on the stock between the two arms of the square represent the length of the rafter, and this space may be read off on the scale of the stock where this scale is cut by the short arm of the square.

When the implement is thus adjusted to determine the length of a rafter, the shorter arm, *a*, will give the bevel for the upper end, and the longer arm, *b*, of the foot, as shown in Fig. 5.

Fig. 3 illustrates the mode of adjusting the implement to be used as a miter, and Fig. 4 shows the manner in which it may be used for laying out stairs; one limb giving the angle for the treads and the other for the rises.

The patent for this invention was granted, through the Scientific American Patent Agency, May 6, 1862, and for the purchase of either the whole patent or territorial rights, or for any further information in relation to the matter, inquiries may be addressed to the inventor, John Iseman, at Rosston, Pa. [See advertisement in our next number.]



ISEMAN'S PITCH SQUARE.

LARGE numbers of steam engines upon the plan of G. H. Corliss, of Providence, R. I., are now made in Silesia, Prussia, and two of them are shown in the London Exhibition.

The Power of Sea Waves.

The following interesting extracts are from an article in the last number of the *North British Review* on the "Geological Changes in Scotland in Historic Times'' :—

Of all the agents of change that have modified the surface of the land, none arrest the attention more than the waves of the sea. One cannot witness the effects of a storm on an exposed coast without being impressed with the enormous amount of wear and tear which is there visible.

No written records of changes effected by the sea in Scotland go further back than four hundred years. It would be interesting if we could trace the gradual retreat of the coast line for the past two thousand years. The force with which the waves of the German ocean fall on objects opposed to their fury has been measured with great care at the Bell Rock Lighthouse. This massive structure, rising 112 feet above the sea level, is literally buried in foam and spray during ground swells when there is no wind. Experiments were made from the middle of September 1844 to the end of March 1845 when the greatest pressure of the waves was found to be 3,013 lbs. on the square foot. When this lighthouse was building in 1807, a storm came on and six large blocks of granite, which had been landed on the reef, were thrown over the ledge to a distance of fifteen yards, and an anchor weighing nearly one tun was lifted out of the sea by the waves and thrown upon the rock. Stone measuring upward of 30 cubic feet and weighing two tuns are frequently lifted from deep water and thrown upon the Bell Rock during storms. The lighthouse keepers call these boulders "sea travelers." The sea at a distance of 100 yards around the Bell Rock reef is three fathoms deep. The breakers in the north sea beating around the Shetland Isles, sometimes tear up masses of rock in the island of Whalsey, weighing 8½ tuns, and these are frequently left heaped in a pile 62 feet high above tide-water mark. Rocks ranging in weight from 6 to 13½ tuns have been quarried by the waves in a storm from their positions in *situ* at levels from 70 to 74 feet above the common level of the sea. One block of 7 $\frac{7}{10}$ tuns weight situated at 20 feet above the sea level has been lifted from its bed and transported a distance of 73 feet, and in its progress it has been lifted over abrupt faces seven feet in hight.

On the west side of the Shetland islands, the violence of the Atlantic has produced scenes of devastation of which it is difficult to convey in words an adequate representation. We see the process going on still with a rapidity and magnitude which cannot but fill the observer with astonishment. In stormy winters huge blocks of stone are overturned and removed from their native beds to a distance almost incredible. In 1802 a tabular mass of rock 8 feet 2 inches, by 7 feet, and 5 feet in thickness, was removed to a distance of 90 feet by the sea in one of the islands. During the progress of erecting a lighthouse on Skerryvore rock—which lies on the west coast of Scotland, exposed to the full fury of the Atlantic, without a ridge of land between it and America—the pressure of the waves was measured in 1843 and 1844 and 1845 by Mr. A. Stevenson, the engineer. During a heavy gale in March, 1845, the pressure was 6,083 lbs. on the square foot. In winter the average pressure is 2,086 lbs on the square foot, in summer it is only 611 lbs. Thus the greatest pressure is nearly three tuns on the foot—a force which is terrific in its destructive effects.

Polishing Metals.

A patent has been taken out by W. Clark, of London, for the following composition, which he calls brillantine—to be used as a polishing powder for metals: First, an extract of guano is obtained by boiling that substance in water until a concentrated crystalline mass is formed on cooling. Of this extract he takes 100 parts, by weight; 25 parts of calcined tripoli; 12 parts of wheaten flour, and common salt 10 parts; these are all mixed together in a vessel over a moderate fire until a homogeneous paste is formed, which is allowed to cool and harden. It is then reduced to fine powder, and is used for polishing metals and cleaning glass by mixing it with dilute alcohol or any alcohol spirits. It is said to form a very superior polishing powder. The crystallized urates obtained from the extract of guano possess great efficiency in acting upon hard metallic surfaces.

PETROLEUM FOR FUEL.

A few years since—Dec. 24, 1859, page 415, Vol. I. (new series) SCIENTIFIC AMERICAN—we suggested the employment of crude coal oil as a fuel for steamers. At that period we stated that crude coal oil could be obtained at ten cents per gallon, and that one hundred gallons of it were equal to one tun of coal for raising steam. The method we proposed for the burning of the oil was to convey it from elevated tanks in tubes, and allow it to pass through minute perforations in blocks of fire brick or soapstone, in the furnace under the boilers. The great subterranean repositories of petroleum in Western Pennsylvania and Canada, were not then discovered; and if the reasons we then advanced for the employment of such oil as fuel were sound, they are far more so now, on account of the unlimited quantities of earth oil that can now be obtained at very low prices. The following, from the Pittsburgh *Daily Chronicle*, shows that a beginning has been successfully made to employ liquid fuel in the manner we had suggested:

It is stated that the firm of Clark, Rust & Walker, proprietors of an oil refinery in Erie county, are now using naphtha, or benzine, as a substitute for coal in heating their furnaces. The naphtha is introduced into the furnaces by means of pipes, constantly feeding the fire by a gentle flow, and keeping it up to any heat that may be desired. It saves the labor of two men, and also the cost of about eighteen dollars' worth of coal per week, making an aggregate in reduced expenses of some thirty dollars. There being no demand for naphtha, it has accumulated on their hands, and they are, of course, gratified at the discovery of a means of disposing of it in the prosecution of their regular business.

THE business at Windsor Locks, Conn., which had been much depressed by the war, is beginning to revive and flourish. The paper makers and sewing silk manufacturers in this place are now doing a good business.