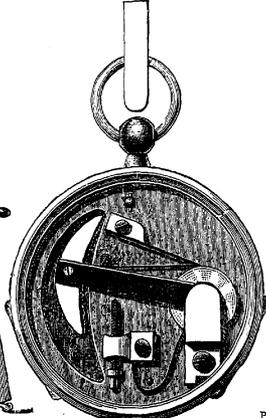


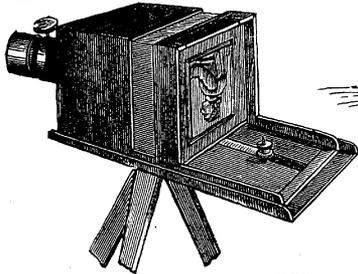
PHOTOGRAPHY—STUDIO STAND.



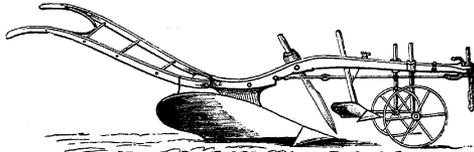
PEDOMETER.



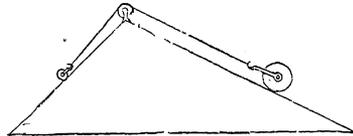
PEN MAKING—STAMPING PEN FROM STEEL.



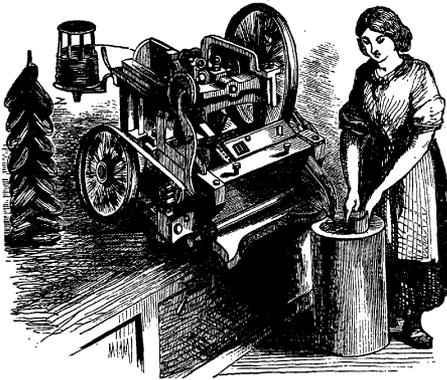
PHOTOGRAPHY—BOX CAMERA, SLIDING.



PLOUGH.



INCLINED PLANE.



PIN-MAKING MACHINE.



PEN MAKING—BENDING THE PEN.

A

BEETON'S
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AND COMMERCE.

INCLUDING

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A

P R E F A C E.

THE useful arts practised by mankind grow every day in number and importance. When we consider the contrast between civilised and savage man in the number and nature of the arts which they have learned or on which they are dependent, we are forcibly struck with the immense differences of acquirement, skill, and invention which they represent. The great tendency of the present day is towards specialisation, or the devotion of special energy and study to the acquirement of perfection in a limited department of ingenuity, as the polishing of a pin or the casting of an account. No doubt this tends to produce everything perfect of its kind, but it is also liable to dwarf the development of the whole man, to turn us into mere animated machines rather than reasonable beings able to take an intelligent interest in the doings of mankind generally. To counteract this injurious tendency is the object and useful purpose of a Dictionary like the present, which aims at putting within the reach of every one accurate information on a multitude of useful industries, manufactures, and arts, by which the comfort and well-being of mankind are advanced.

Moreover, in almost every occupation, a thoughtful man, intent on advancing himself in his calling, will find opportunities for employing knowledge of subjects closely or more distantly related to that which he is specially concerned in. Next to special knowledge of a particular thing, general and widespread information, which may be made useful or brought to bear on questions relating to it, is most valued. We have not yet come to the point at which general intelligence ceases to be regarded. Every man who possesses a quick mind, eager and ready to bring to bear knowledge gained in various quarters, is sure to make progress. By no means can he so rapidly advance himself as by having ready to his hand a Dictionary in which he may seek out just the general information he requires. Opening it anywhere, he will discover stores of knowledge which it will profit him as well as give him pleasure to read. Seeking in it information on any topic within its scope, he will gather concisely-stated and interesting facts which it might have cost him much time to obtain from two or three different treatises, where the information might be given in a much less condensed and clear form.

The accountant will often find his work easier if he knows a little about the various terms in use in the businesses whose accounts he has to set forth clearly. The agriculturist would be greatly benefited by understanding something of the chemical, mechanical, and other industries to which he is indebted for his machines, his manures, and other essentials of his business. How often the cotton, woollen, or iron manufacturer finds out his need of chemical knowledge, and would be glad of the help of a Dictionary containing the needful information. Every engineer should have at hand knowledge relating to many arts and manufactures which are essential to his work, or which he comes across in providing them with machinery. There is scarcely a tradesman who is not interested in shipping and sea terms, in some way or other, whether by using or dealing in substances which have crossed the sea, or by having relatives at sea either temporarily or as their profession. And who can tell the vast importance of such a subject as banking to almost every one who occupies even a modest position in life? These are but a few of many instances which might be referred to, in which this Dictionary is capable of rendering most important aid—indeed, of proving itself a necessity of the highest value. To young men, in particular, it is recommended as capable of becoming, by wise and diligent use, the foundation of a very creditable success in life.

DICTIONARY OF MECHANICS, INDUSTRIAL ART, AND COMMERCE.

A1

ABATTOIR

A1, a mark employed in Lloyd's Register of Shipping, to denote first-class vessels. (See LLOYD'S.) The letter designates the character of the hull of the vessel, as built in the best manner, and the numeral the efficient state of her stores, cables, anchors, &c. A new ship is registered in class A for a period varying from four to fifteen years, and at the expiration of that time the character may be renewed on condition that the seaworthy condition has been retained by repairs. Periodical surveys are made, to see that the character of the vessel is maintained.

AAM, or **HAAM**, *awm*, a Dutch liquid measure, containing 288 English pints.

ABACA, *ai'-ba-ca*, or *Manilla Hemp*, the fibre of a species of plantain or banana, a native of the Philippine Islands. Very large quantities are used in the manufacture of rope at Manilla. The leaves are split, and the fibrous portion separated. The rope is very durable, but not very flexible.

ABACISUS, *ab-a-sis'-kus*, in Arch., a diminution of the term Abacus, and applied to the cheques or squares of a tessellated pavement.

ABACK, *a-bak'* (in nautical language), the situation of the sails when they are pressed against the masts by the force of the wind.

ABACUS, *ab'-a-kus* (Gr. *abak*, a tray, or flat board), in Arch., a constituent part of the capital of a column, which supports the horizontal entablature. Vitruvius attributes its invention to Callimachus (about 540 B. C.), who, observing a basket covered with a tile placed over the root of an acanthus plant (see ACANTHUS), was so struck with its appearance, that he imitated it in sculpture, by making the whole group the capital of a column, in which the tile was represented by the abacus, the growing leaves of the acanthus by the volutes, and the basket by the body of the capital. Square tablets on walls, in ancient architecture, were included in the term abacus.

Tuscan, Doric, and Old Ionic Orders.—Flat and square or oblong.

Corinthian, Composite, and New Ionic.—Concave sides and truncated angles.

Saxon.—Frequently chamfered or grooved.

Norman.—Square in small work, but sometimes octagonal, when larger; and in some instances sculptured.

Early English.—Generally circular, but sometimes octagonal, and more rarely square.

ABACUS, Latin, *abacus*, counting table or tablet, in Arithmetic, is the name of an instrument

once employed in England to teach the elementary principles of the science of numbers. It consisted of a frame with stretched wires, on which beads were strung. The ancient mathematicians also employed the term abacus to designate a table covered with sand, upon which they traced their diagrams.

Pythagorean Abacus is a term sometimes applied to the multiplication table.

Chinese Abacus, or *Shwan-pan*, *Shwan'-pan*, is also an instrument for facilitating arithmetical calculations. The principle is the same as that of the English abacus, except that it is only applicable to a decimal system of arithmetic.

ABAIT, or **AFT**, *a-baft'*, in maritime language, signifies the hinder part of a ship. "Aft the beam," signifies the relative situation of an object in some part of the horizon contained between a line drawn at right angles to the keel and the point to which the stern of the ship is directed.

ABAGI, or **ABASI**, *a-ba-jeel'*, a Persian coin, of about the value of eighteenpence English.

ABANDONMENT, *a-ban'-dun-ment*, a term made use of in marine insurances, where, prior to compensation being demanded for the loss of a ship or goods, the owner must abandon or make over to the insurer his entire interest in any portion of the rescued property.

Abandonment of Railways.—The Board of Trade may, on the application of a railway company, with the consent of holders of three-fifths of the shares or stock, authorise the abandonment of a railway or part of it.

ABATTIS, *a-bat'-tis* (Fr., *abatire*, to knock down), in Fortification, a work constructed of felled trees, placed side by side, with their branches, the stronger of which are left on, turned towards the enemy in such a way as to constitute a form of defence for troops.

ABATTOIR, *ab'-a-twor* (Fr., *abatire*, to knock down), a slaughter-house. The Abattoir system originated in 1807, when the Emperor Napoleon made a decree for the erection of public abattoirs. There are at present near Paris five immense establishments of this kind, where butchers are provided with a place for slaughtering their cattle and keeping their meat in store. There are also places for supplying the beasts with water, receptacles for the fat, hoofs, blood, brains, &c. Public abattoirs are now established in many of the larger towns of Great Britain, the Continent, and America. The first in the United Kingdom

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A.