Items which Interested the Publishers.

To hear encouraging words from one's contemporaries is always gratifying to publishers. And probably there are few, if any, of the conductors of newspapers in this city more favored in this respect than are the publishers of this paper.

It is seldom we allude to ourselves in these columns, or to what others say of us, but we claim the indulgence of our readers for the space required to copy notices of three of our publications selected from a huge pile of similar ones taken from papers published in every State of the Union.

Of the SCIENTIFIC AMERICAN, the Toledo *Medical Compend* says: "No publication comes to our table that is more highly prized than this old substantial journal. Aside from keeping the public fully posted respecting new inventions and scientific developments, it contains a vast amount of the practical and useful. The engravings are of remarkably high order, and matter accompanying them is so tersely put that such subjects as might, under ordinary circumstances, be considered dry and heavy are not only readable, but highly enjoyable. It is the best conducted scientific journal in the United States, as well as being typographically the handsomest. Its circulation is larger than all the others of its class combined."

Of the ARCHITECT AND BUILDER EDITION of the SCIENTIFIC AMERICAN, *Light*, a newspaper published at Worcester, Mass., says: "If one could only realize all the dreams of the architect in this April number, what beautiful homes we might have! It is true that some of them are not excessively expensive, but houses that cost even a few thousand are beyond the reach of many readers of *Light*. Perhaps the most reasonable design is that of a house costing $2,700. Of this there are three views, besides plans for the two floors. Such a building is perfectly feasible to the man who is paying fifteen or twenty dollars a month rent. By the aid of our co-operative banks he could pay for the structure in a few years, and thus have a beautiful home of his own. The illustrations and description range upward to the palatial home in the great city. The April number of the ARCHITECT AND BUILDER EDITION also contains a very interesting page of cuts illustrative of English village houses."

And now comes what Colonel Church, author of the biography of Captain Ericsson, and editor of the *Army and Navy Journal*, has to say of "Experimental Science:" "It is illustrated by more than 680 engravings and is a complete encyclopedia of physics, teaching by the experimental methods and converting the dry studies which once oppressed the classroom into an exhilarating pastime. It may, indeed, serve as a substitute for the 'Boy's Own Book' of an early day, carrying the young student and experimenter as far beyond the possibilities of his father's youthful studies as modern science is in advance of the learning of an earlier day. The solution of all of the problems is within the possibilities of simple arithmetical methods. The material for the work is furnished by articles in that fascinating and useful publication, the SCIENTIFIC AMERICAN. These have been revised or rewritten with copious additions and engravings that are far superior in clearness and interest to the conventional illustrations of the ordinary text books. A lad of 16 to whom we have given the volume," the colonel adds, "finds it of unfailing interest. The variety of experiment is endless."

Gun Cotton.

In a recent lecture on gun cotton delivered by Prof. Munroe, of the Torpedo Station at Newport, the lecturer declared that gun cotton, correctly prepared and handled according to directions, was the safest of explosives to use. It was dangerous only when the matrials had not been thoroughly purified, or the union of acid and cotton incomplete.

In proof of what could be done with it, a picture was thrown upon the screen showing the workman cutting it with chisel, jig saw, and lathe to fit it into a shell. Another illustration was the extinguishing of a block that was burning by pouring water upon it. Two thousand pounds of it had been burned in a bonfire without explosion.

One volume of the explosive gives 829 of the gas, and the pressure developed by combustion is 81 tons to the square inch, and by detonation 157·5 tons, the latter being in contact, however. The effect of the explosion of one particle on another is so rapid that it would take only one second for it to pass through 19,000 feet of the explosive.

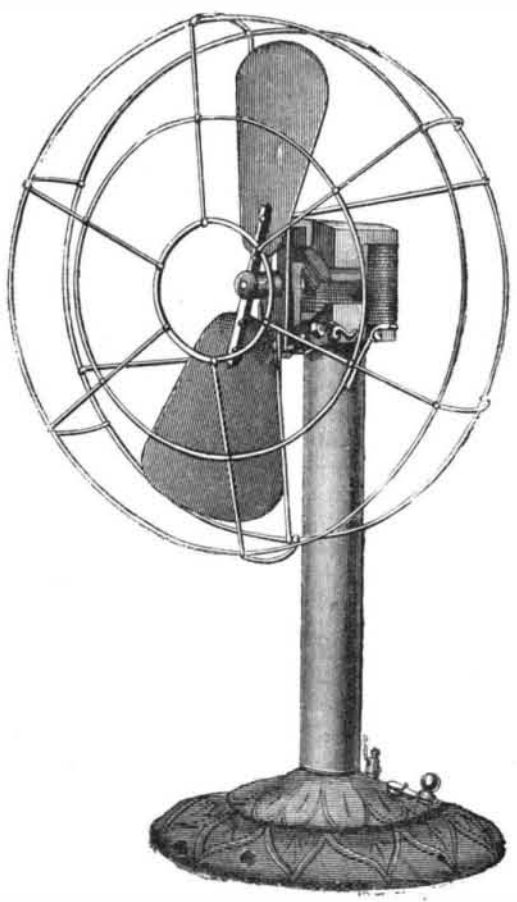
It was shown by the stereopticon that the letters U. S. N., with the date of manufacture, that are in the bottom of each block, are impressed upon an iron plate upon which the gun cotton may be exploded. It is a curious fact that, if the marks on the block are in relief, the reproduction on the iron will be raised · and if cut in, there will be an indentation on the plate. Prof. Munroe's theory is that when the letters are cut into the explosives, the gases generated in the indentations are hurled from them as a projectile from a gun. If a leaf or a delicate piece of lace be laid between the gun-cotton and the iron, its impress will be left in all the perfection of outline of the original, though the article itself is absolutely annihilated.

AN IMPROVED VELOCIPEDE.

The machine shown in the illustration is designed to be readily propelled over heavy grades, having means for regulating the application of power therefor, and is adapted for use by ladies as well as gentlemen. It has been patented by Mr. Andrew W. Schieding, of Turner's Falls, Mass. The large driving wheel has bearings in a horizontal frame, a forward extension from which drops nearly to the ground, and in this portion is

SCHIEDING'S VELOCIPEDE.

pivoted the axle on which the forward wheels are mounted. A top, indicated by dotted lines, is designed to cover the front portion of the vehicle, which it may be made to cover wholly, with suitable doors. Mounted loosely on each end of the hub of the driving axle are skeleton pulleys, the inner flange of each pulley having a radially projecting extension, as shown in the small detail view. To each of these extensions is pivoted a spring-pressed pawl engaging the teeth of a ratchet wheel on the end of the hub. Pivoted near the front axle are treadles, which have rearwardly extending side pieces in which are pivoted pedals. On the outer side piece of each treadle are lugs to which the operating cable is attached, the lugs being so placed as to give an increased or diminished leverage. The cable extends from the lug over one of two pulleys pivoted in opposite sides of the frame just back of the seat, thence once around one of the skeleton pulleys on the driving wheel axle, thence around two pulleys pivoted at opposite sides of the machine near the ground, in front of the driving wheel, and thence around the opposite skeleton pulley on the driving wheel axle, and back over the



DESK FAN OR SMALL DENTAL MOTOR.

pulley back of the seat to attachment with a lug on the opposite treadle. On the rotating of the skeleton pulleys by the cable, as the treadles are depressed, the pawls on these pulleys engage the ratchet teeth on the hub of the driving wheel to operate the latter. To increase the power, the ends of the cable are attached to other lugs on the treadles nearer their pivotal point, the speed being correspondingly diminished. A rod extending along the sides and across the back of the seat has its rear portion formed into a crank on which a brake shoe is pivoted, in position to be conveniently applied to the rim of the driving wheel. A lever attached to a plate on the front axle extends upwardly and rearwardly toward the seat, and by turning this lever the operator can readily steer the machine to the right or left. A tug is attached to the lower forward portion of the frame, with a handle or loop, for use when the velocipede is to be driven up a steep grade, thus increasing the power to press upon the treadles. With the aid of the tug, from which a strap may be extended over the shoulders if desired, and the increase of power to be obtained by the attachment of the ends of the cable to the lugs in the central part of the treadles, very great advantages are obtained when the grade is exceptionally heavy. The machine is readily operated by a rider in either a standing or a sitting position.

Energy.

Before the Thomson Scientific Club, at Lynn, Professor Thomson recently delivered a very interesting address on "Energy."

Formerly, he said, matter was considered as the thing that existed, and force the something that acted upon it. Energy is a term used to express something which we do not always understand. It exists everywhere so far as we know. Matter was considered indestructible. If we admit that energy can act on energy, we have no need of the old matter and force. We can see the changes in energy, though we cannot discover the thing itself. We have potential and active energy. Potential is simply stored energy, power to do work. The water in the reservoir is the same as the water a hundred feet lower, but it can do work that the other cannot, because it has energy stored in it. When that water is running down the hill and turning the wheel, it shows its actual energy. The earth revolving is another case of stored-up energy, as is also a wheel in motion. A spring is an example of elastic energy. In a boiler we have kinetic energy transformed from the heat of the fire. These are all mechanical forms of energy. The cannon ball shot into the air shows energy of motion in its ascent. When it reaches the highest point, it has energy of position. When it strikes the ground and bounds, it shows elastic energy. Besides this there is energy of temperature, which the hot cannon ball possesses. This is called molecular energy. If we could take all the heat out of anything, it would become liquid and then frozen. This has been done even to air. There is another or electric energy, another chemical and another radiant. Every form of energy is convertible into any other, sometimes at so great waste as to be impracticable for use. In converting mechanical energy into heat it is almost perfectly efficient, but in converting heat to mechanical motion ninety per cent is lost. The energy of heat is disorganized as contrasted with the organized, direct energy of motion. A disorganized army, each soldier going his own way, can do little. The tendency in nature is to degrade energy.

DESK FAN OR SMALL DENTAL MOTOR.

A small motor of new design and high efficiency, intended particularly for nse in connection with a desk fan or dental motor, has recently been introduced. It may be used for any work requiring light power. The working parts are substantial, and not liable to wear or get out of order in any way.

It may be operated by an acid primary battery at a cost of not exceeding seven cents for ten hours' continuous service.

The motor may also be operated by a storage or secondary battery, charged from a simple and efficient primary battery. It is easily set up and requires little care. It may be located in any convenient closet or cellar, and connected with a small storage battery and the motor. A switch on the motor is arranged so that when it is thrown so as to stop the fan, it connects the primary with storage battery; the latter being, therefore, charging during all the time that the motor is not in use. A fan or light power motor is thus made available anywhere on short notice, in the sick room, in the office or library, or in any place where it can administer to the comfort or convenience of the occupant.

The same battery can be used to ring bells, operate signals, or do any similar electrical work that may be desired.

The motor and blades of fan are all finished in nickel, and the outfit will be an ornament in any location.

The motor, as fitted up for shipment, has the fan attachment, that being the service that is most often desired.

This motor is manufactured by the Novelty Electric Company, of 52 North Fourth Street, Philadelphia, Pa. It also manufactures electric motors for fans and other light power, of high efficiency, for use in incandescent light circuits, ⅛, ¼, and ½ horse power, and small dynamos, 2, 4, 8, and 20 16-candle power incandescent lamp capacity. Also annunciators, electric bells and burglar alarms.