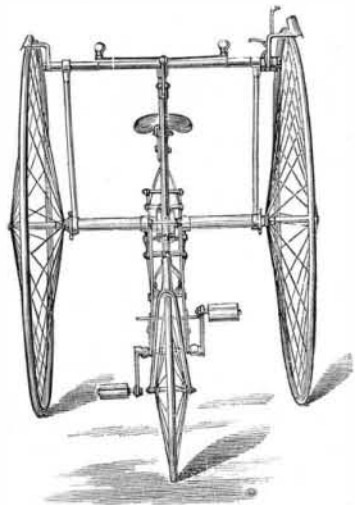


Heat and Magnetism.

L. Pilleux has lately called attention to the heating of iron during its magnetization. The fact had been previously observed by D. Tommasi in some researches, which are not yet published, upon the comparative study of the chemical properties of ordinary iron and of magnetized iron. In order to obtain a constant magnetic intensity, he employed an electromagnet of a single branch in place of an ordinary magnet. When the current, even if it was produced by a weak battery, had traversed the coil for some hours, the magnetized bar became perceptibly warm. He at first attributed the heating of the iron to the heating of the coil; but he was greatly astonished, one day, when he had removed the bar in order to clean it and had forgotten to interrupt the current, to find that the coil was not heated at all.—*Les Mondes.*

IMPROVED TRICYCLES.

In the "Leicester Safety" tricycle the rider is placed upon a saddle vertically above the pedals, and can therefore



THE "LEICESTER SAFETY" TRICYCLE.

employ the effectual downward thrust so approved of by the medical profession. He has before him a safety bar upon which he may rest his hands, from which he may steer and apply the brakes, and which also serves to prevent his falling forward when moving down hill. The tricycle is a front steerer, which adds still more to its safety in the descent of hills. The gearing has the advantages of backward and forward double driving combined in one central endless chain passing from the pedal crank to the axle. Steering is effected by the front wheel, which, from the construction of the entire machine, must always have a large percentage of the rider's weight pressing upon it to insure its efficacy. Behind the rider, to prevent all possibility of a fall backward, is a bar or tail, which adds also to safety in mounting and dismounting. The brakes act upon the tires of the driving wheels by a movement of the wrists, the right or left being applied as desired, or both together, while the steering can be effected at the same time, and without moving either hand from the safety bar.

In order to provide a tricycle for use in India and other countries where native labor is abundant, and the climate such that a European finds all outdoor exercise impossible, a tricycle has been devised to be propelled by cooly power, which our engraving clearly shows. The brake is applied to a drum on the gearing box. The standard size of the driving wheels is 48 inches, and these can be geared either level or slightly down; for hilly countries the latter is recommended. It is made single to seat one European, driven by one cooly, or in a double form to seat two Europeans, propelled by two coolies. The native driver sits behind, pedaling and steering the machine, which becomes, as a matter of fact, a cheap kind of carriage, requiring no horses, and no stabling or coach house.

A Place where They Have no Flies.

A correspondent of *Science* says: I remember, years ago, seeing a dried specimen of the house fly sent to Boston in a letter, as a great rarity there—the only one the sender had seen in a year's residence in Manila. As this is one of the constant accompaniments of man, and a sure sign of his presence or vicinity, I was at a loss to account for its absence. It is not even found in the sugar yards in any great numbers. I now see why it should be so rare, viz., because it could not of itself pass over the six hundred miles of the windy China sea; and the few which might be transported on vessels, if they got ashore from their distant anchorage, would be prevented from multiplying by their numerous enemies—bats, spiders, birds, lizards, and other reptiles. Some days I would not see one, and rarely more than two, around the table. Were they common, with the other insect pests, life would be almost unendurable in these islands.

It is now proposed to make nails from Bessemer steel. It is claimed that when made at half the weight of iron, the nail is stiff enough to be driven into the hardest wood, and tough enough to clinch.

Progress of Quarrying.

The Compendium of the Tenth Census, recently issued, contains some figures which will serve to give an idea of the magnitude of the quarrying interests of the country, which in 1880 gave employment to 39,723 men, 8,059 horses, and 851 mules; had 339 machines for quarrying, 2,290 machines for hoisting, 1,308 machines for dressing, and used \$192,175 worth of explosives. The capital invested is given at \$25,414,497, and the value of the product in the census year at \$18,356,055, there being 1,525 quarries in all. Marble and limestone lead the list with 65,523,965 cubic feet, followed by the sandstone quarries with 24,776,930 cubic feet; crystalline silicious rocks, with 5,188,998 cubic feet; and slate, with 457,267 squares, or 4,572,670 cubic feet.

Professor Henry in Bronze.

Story's bronze statue of Professor Henry, for which Congress appropriated \$15,000, will be unveiled April 19 in the center of a small triangle at the northwest of the Smithsonian building, Washington. It is seven feet high, and stands on a top and base of Quincy grey granite, with a center of red Beach granite, which adds eight feet to the height of the statue. The name Joseph Henry is cut on the red granite in plain Roman letters, forming the only inscription. The Professor is represented as standing in a meditative mood, with one hand resting on a support, and wears an academic gown. The face and figure were modeled in Italy from photographs and a cast of his face and bust made by the late Clark Mills. President Porter will make the oration.

Nickel for Galvanoplastic Purposes.

Nothing is easier, says the *Central Zeitung fur Optik und Mechanik*, than to cover metals with a thin film of nickel by electric deposition. If we wished to make a very much thicker deposit various difficulties stood in the way, which have but recently been overcome by Boudraux and his son in Paris.

It is generally known that if we attempt to precipitate nickel upon a plaster cast, or wax mould, covered with graphite, as we do copper in electrotyping, as soon as the nickel has attained a certain thickness it cracks loose from the mould and rolls up. This phenomenon is explained as being due to the absorption of hydrogen (occlusion) by the crystalline nickel, which is very porous in comparison with ordinary cast nickel, and is able to occlude 160 times its own volume of hydrogen in twelve hours, when it forms the negative pole of quite a strong galvanic battery.

The above named Parisians have removed this obstacle and are now able to precipitate nickel electrolytically to any desired thickness. At the Paris electrical exhibition they exhibited electrotypes, and art reproductions, which were not plated on the articles but upon casts taken therefrom, the nickel being more than a millimeter thick. An electrotype has several important advantages over mere nickel plating, the most important of which is that by the former all the fine lines and the delicacy of expression are preserved while they are more or less destroyed by nickel plating.

Nickel offers three times as much resistance to mechanical pressure as copper, while the density of the two metals is nearly the same (copper 8.90, nickel 8.57), so that a copy of any work of art when made of nickel can be made much thinner than if made of copper, and yet have the same



THE "COOLY" TRICYCLE.

strength with much less weight. Copies in nickel can be backed to any desired thickness by depositing copper on them by the galvanic current.

The highly valued qualities of nickel are these: It is as hard as steel, less oxidizable than silver, it is not acted upon by sulphides, it can be stretched, and is tenacious, it does not melt easily, and the prices are daily going down.

Nickel would be very useful for stereotype plates from which a great many impressions are to be taken, as for

postage stamps, bank notes, etc. Nickel stereotypes would have special value for color printing, because many kinds of colored ink attack copper (vermillion, for example) and destroy the plates, while their own brilliancy is also affected by the copper faced type and plates.—*Deut. Industrie Zeitung.*

IMPROVED FIRE ESCAPE.

We give an engraving of a light, portable, and simple device for receiving persons jumping from upper portions of buildings in case of fire. The apparatus consists of a blanket made of two or more thicknesses of strong canvas provided with coil spring supports and sustained by a folding adjustable frame of wood.

The frame has four legs pivoted together near the middle, and the canvas blanket is secured to a rectangular frame formed of wooden rods linked together at the ends and pro-



JOLLEY'S FIRE ESCAPE.

vided with rings capable of receiving the upper ends of the legs.

The blanket has pockets containing coil springs, which are attached by their outer ends to the rods forming the frame of the blanket. These springs serve to assist the blanket in resisting the shock of the person falling into it. The legs of the escape are made adjustable to adapt it to a rough or sloping surface, and a ladder is provided to enable persons to reach the ground from the blanket. The fire escape is very light and portable, readily set up, and affords a yielding surface upon which people may jump without injury.

This invention has been patented by Dr. William F. Jolley, of Middlesex, N. Y., who may be addressed for further information.

Use of Hand Tools in the Schools.

Speaking of the refusal of the Massachusetts House of Representatives to pass to a third reading the measure which authorizes instruction in the elementary use of hand tools as a part of the public school course, the *Boston Journal* says: If the true aim of the school is in reality the preparation for active life, that aim cannot be accomplished by exclusive brain development, for even in the most clerical pursuits the hand must often come to the brain's assistance, and with practical skill be employed in practical uses.

How many of our graduates can drive a nail? How many can split firewood in the easiest way? How many can saw, plane, bore, glue, make a box? Many of our youth in the schools to-day, who seem to lose their ordinary wits when a book is placed before them, would become master workmen with tools, if once given the opportunity of their use; and even the most studious scholars would rather gain than lose with this power over inanimate things which is won by the knowledge of the use of tools. Besides the advantage of manual skill, it has been shown by experience that intellectual training is assisted by a carefully arranged and systematic instruction in this branch of industrial science.

Undue attention to purely mental studies is diverted, the intelligence is aroused, and a healthful and revivifying change is brought about by active occupation. The testimony of physicians has shown the advantage to pupils, physically, in the use of tools. If the course of study is already crowded with different branches, there could easily be formed plans of either omitting a not indispensable study or of adapting the scheme of recitations to the addition of the tool practice. Results in Europe and in this country have proved that this course of

elementary training is in nowise a burden, but a benefit to instruction in the regular old time branches. As the educational science advances, new ideas work an improvement upon old methods. It is the spirit of the age to ennoble manual labor, and to teach the young to look upon citizenship through labor as a right beyond the right of birth or wealth. If instruction in the hand working trades can assist in inculcating this true spirit of democracy, it is certainly the privilege of schools to supply the elements of instruction.