

A NEW TOOL.

The engraving shows an improved tool which can be used either as a monkey wrench or bench vise. The wrench consists of a square bar, having upon one end a fixed jaw, and upon the other end an arm having a screw-threaded opening which receives the screw for moving the adjustable jaw placed on the square bar. The wrench is capable of being used like any ordinary wrench, and when it is desired to employ it as a vise it is held in a bed plate, arranged to clamp the bar of the wrench both lengthwise and sidewise.

This invention will be found very useful to those requiring a wrench and vise occasionally, and by mechanics who are frequently using both tools.

Further information may be obtained by addressing Mr. William H. Love, Love's Station, Miss.

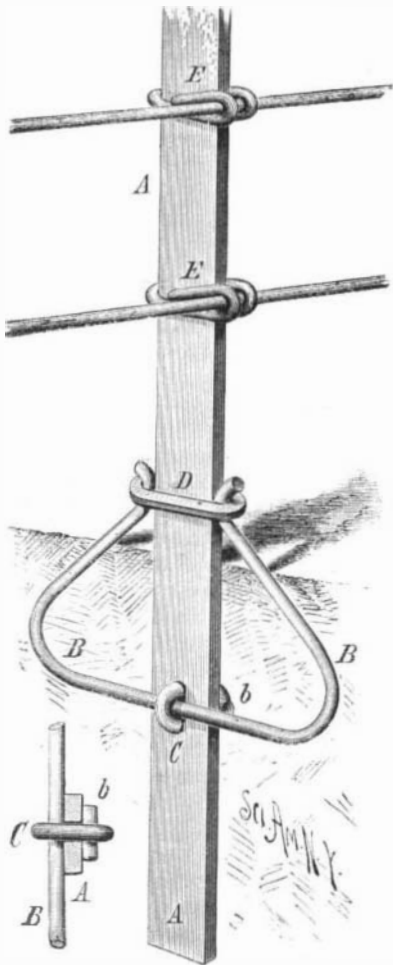
A Good Day's Work on a Railroad.

The work of changing the gauge of the Chicago, St. Louis, and New Orleans Railroad, between Cairo and New Orleans, was begun at 4 o'clock of the morning of July 29. The work was finished and trains were running at 3 o'clock in the afternoon of the same day. The work consisted in shifting the west rail $3\frac{1}{2}$ inches, making the gauge 4 feet $8\frac{1}{2}$ inches. The length of road changed was 571 miles, exclusive of sidings. About 2,500 experienced workmen were employed in gangs, each gang having charge of eight miles of track. The division from Cairo to Milan, 84 miles, was changed by 8:50 A. M. The division from Canton to New Orleans, 206 miles, was completed at 9:20 A. M. The work was in charge of Col. L. P. Brien, and was accomplished without mishap or delay.

AN IMPROVEMENT IN IRON FENCES.

The improvement in iron fences, shown in the annexed engraving, has recently been patented by Mr. Samuel Heaton, of Cedar Rapids, Iowa. It is noteworthy principally on account of its simplicity and cheapness. The post has but one aperture, and that is made so near the lower end as to have no effect on the strength of the post, and the braces and rods or wires are fastened by a very simple and effective means.

The post consists of a piece of flat bar iron, having an oblong hole punched in it near the lower end. The brace

**HEATON'S IMPROVED FENCE.**

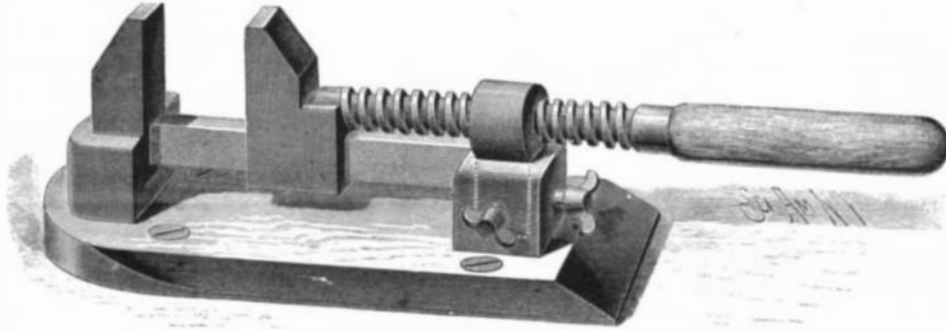
consists of a curved piece of round bar iron, bent into approximately triangular shape, having its ends at the open angle, bent outward to receive the link which binds the ends to the post. The brace is attached by slipping the link over its free ends, and then passing the post through the link between the ends of the brace. The lower part of the brace is secured to the post by a link, previously placed upon it, which passes through the slot in the post and receives a key or wedge upon the opposite side.

The wires or rods forming the bars of the fence are secured by loops or staples which embrace the post and are bent around the wire.

The advantages of a post of this description will be readily understood without further description.

The Faure Battery.

Some personal feeling must exist in the minds of the French writers on electricity against M. Faure, judging from the way in which they compare his secondary battery with M. Planté's. Any one who chooses to test the Faure cell and the Planté cell cannot fail to be convinced that the former is decidedly the better one. Sentiment, passion, and prejudice enter so largely into what ought to be the calm reason of the French people that one is compelled to receive their conclusions regarding anything with some neutralizing substance—an acid or an alkali, as the case may require.

**LOVE'S COMBINED WRENCH AND VISE.**

In the Faure case the declarations of French electricians must evidently be accepted by minds otherwise constituted not simply with a grain, but with an overwhelming dose of salt. Prof. J. A. Fleming, of the University College, Manchester, England, says candidly that "the enormous superiority of M. Faure's cell over the old form of Planté's cell is evident at once on experimenting with it." And, by the way, Prof. Fleming is justly entitled to the credit of devising the following admirable method of showing large assemblies the action of the Faure battery, about the end of last June, before he had the opportunity of looking over M. Faure's patent papers. His own words are given with one bracketed qualifying clause: Sheets of lead were bent up into the form of shallow trays one foot square and one inch deep; in each of these was placed a layer of red lead, then a layer of flannel, then a layer of red lead, and, lastly, another lead plate. These trays, to the number of six, were then piled one above the other after being filled with dilute acid. The cells, being connected in series, were polarized by a ten cell battery of Grove's cells, and after twenty minutes charging had taken up [or rather had induced conditions of remanifesting] a very large quantity of electricity. At a short lecture during the evening the charged Faure battery was connected with a Gramme machine and drove it round with considerable velocity for some minutes. After thus employing part of the charge the remainder was used for heating several inches of platinum wire, and for driving for a few seconds a simple form of magneto-electric engines. These experiments amply confirmed those present of the practical character of M. Faure's invention.

MISCELLANEOUS INVENTIONS.

An improved swimming apparatus has been patented by Mr. William Beeson, of Dillon, Montana Ter. This invention relates to a novel construction of swimming apparatus, and it is in the nature of a detachable suit provided with pockets or receptacles for the body and limbs, and having between the pockets for the limbs a web portion, which acts like wings or fins, which, from the movement of the legs and arms, effect a propulsion through the water.

An improved pillow or bolster has been patented by Mr. William T. Doremus, of New York city. The object of this invention is to prevent the stuffing of pillows and bolsters from being crowded out of place by pressure applied to parts of the pillows or bolsters. The invention consists of a pillow or bolster made with an inner cover filled with stuffing, and an outer cover having a layer of stuffing interposed between it and the said inner cover, whereby the stuffing will be kept in place when under pressure.

An improved switch for butchers' tracks has been patented by Mr. Charles Cole, of West Newton, Mass. This invention relates to an overhead track on which runs trucks provided with hangers, upon which heavy articles can be suspended beneath the track and readily moved from place to place; and its objects are to provide a convenient way to connect the main track with the branches which extend to different parts of the room or inclosure, and to provide a convenient method of shifting such connecting main track from connection with one branch to connection with another.

An improvement in shipping cases has been patented by Mr. Charles R. Peaslee, of Louisville, Ky. This invention is an improvement in the class of shipping cases for large oil cans, in which interior grooves are provided for reception of the gudgeons or pivots of the can for the purpose of protecting them while the can is being shipped.

Mr. James H. French, of Willimantic, Conn., has patented an improved package for fire kindlers which will prevent the evaporation of the turpentine and other volatile substances contained in the kindlers.

An improved cushion has been patented by Mr. William T. Doremus, of New York city. The object of this invention is to prevent the displacement and the packing of the stuffing in cushions for beds, lounges, chairs, and other arti-

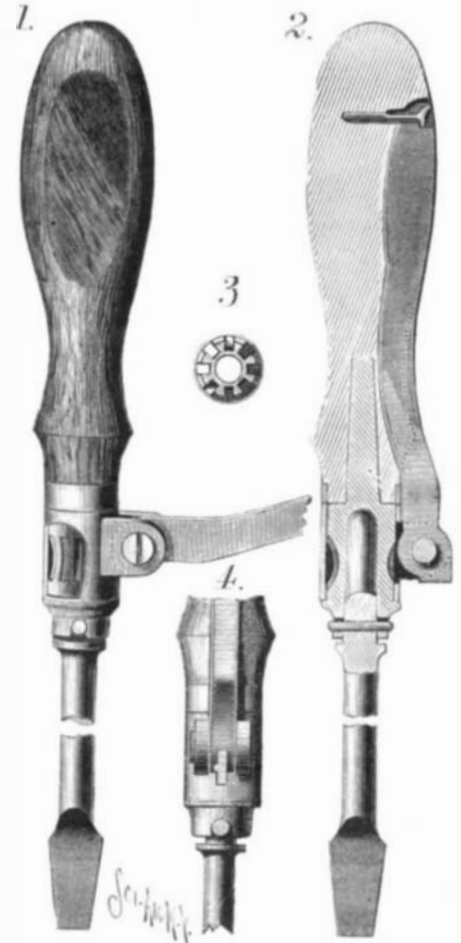
cles of furniture. The invention consists of a cushion made of two or more small elastic parallel rolls connected along their adjacent sides, whereby the elastic material forming the stuffing is kept from being displaced and becoming packed.

A HANDY TOOL.

Slotted head machine screws, which leave the work flush by sinking the heads, are much used in machinery and tool construction, and sometimes are of so large diameter and such length of threaded portion as to present considerable resistance when nearly seated. The use of a wrench on the blade of the screw driver to give additional leverage is a coarse and makeshift method of overcoming the resistance, and, in many instances, is inconvenient, as the crowded position of the screw makes it difficult to get the necessary half or quarter turn.

The object of the improvement shown in the engraving is to obviate these difficulties and provide a handy and useful implement, which will not only take the place of the screw driver and wrench, but will serve as a substitute for the cumbersome and heavy ratchet wrench. It has all the advantages of a ratchet wrench in making short movements, and all the uses of the screw driver in driving the screw in the ordinary manner by means of the usual style of handle.

It is really a screw driver handle, with fixed steel socket, to receive the shanks of the screw driver blades, or of socket wrenches, as desired. On the socket is a sleeve that turns freely and covers a ratchet, or rather a square-toothed pinion, secured rigidly to the steel socket. There is pivoted to the sleeve a steel lever, which, when not in use, shuts into a recess in the wooden handle, and when thus shut the entire implement is only an ordinary screw driver, neither the ratchet nor the pivoted lever taking any part in its action. When used thus, as an ordinary screw driver, it merely drives the screw until the resistance becomes too great, when the lever, in connection with the ratchet, is brought into action. For this purpose the lever is allowed to swing out of the handle, and as it assumes a horizontal position its pivoted end, as a tooth, engages with the toothed ratchet inside the sleeve, and gives means for a leverage corresponding with the length of the arm, which may be nearly

**SCREW DRIVER WITH LEVER ATTACHMENT.**

that of the screw driver handle. A very slight movement of the lever serves to disengage it from one tooth and engage with the next, or with any other, the gradations depending on the number of teeth in the ratchet. A movement of one eighth of an inch, demanding eight teeth, is generally sufficient for the most cramped position. But a larger number of teeth in the ratchet, and a consequent shorter movement of the lever, may be had if necessary, or, if circumstances warrant, the lever may be swung so as to get one-quarter or one-half, even, of the circle.

Mr. L. E. Rhodes, the inventor, is a practical mechanic, in the employment of the celebrated Pratt & Whitney Company, Hartford, Connecticut. The implement has had sufficient trial and use to establish its value in the shop.

A New Safety Lamp.

Mr. Fleuss, the inventor of the diving helmet known by his name, and by means of which a man can take oxygen enough with him to remain under water more than an hour, has recently devised a new safety lamp based on the same principle. It is about twelve inches in height, and is composed of a stand, oxygen chamber, spirit tank, and cover. The oxygen chamber is spherical in shape, and is made of strong copper. It contains oxygen pumped in at a pressure of 260 pounds, and its outlet is a small pipe, furnished with an escape valve and regulator, opening close to the wick. Above the sphere is a little square tank containing methylated spirits for burning in the lamp, and upon it is closely screwed a socket holding the wick. Close to the wick is a thin iron rod, upon which is fastened, in the usual manner, a piece of lime. When the wick is lighted a stream of oxygen is turned upon it from the little pipe by means of the regulator and valve, and the flame is blown upon the block of lime, the light produced being of the most intense kind.

Over the lighted wick, the oxygen blowpipe, and the rod of lime a strong copper casing is screwed down, and the light is thrown through a bullseye in the side of this cover. The casing is dome-shaped, and is made with a double skin, the intervening space being filled with water. On the lower part of it is an outlet valve, by means of which the products of combustion are permitted to escape into the water between the skins of the case, and to find their way through it into the outer atmosphere, an escape valve on the top of the cover being the ultimate means of egress. The lamp is said to have borne all tests with most satisfactory results. It heats little, and is easily managed.

Deep-sea Soundings.

Captain George J. Belknap, commanding the United States steamer Alaska, reports to the Navy Department, under date Callao Bay, July 6, 1881. He gives detailed results of soundings in a run of 112 miles directly offshore. At a distance of 102 miles he found a depth of 3,368 fathoms, or nearly four statute miles, the deepest water yet found in the South Pacific, or in the eastern margins of both the North and South Pacific. Hoping to find a still deeper depression of the ocean bed he stood ten miles further to the westward, but only found 3,168 fathoms. In both casts the specimen cylinder brought up clay and greenish sand, and the bottom temperature of the deepest was about 34° Fah.

Grasshoppers in Turkey.

Turkey, it appears, is overrun with grasshoppers, and the government has been compelled to employ extraordinary measures to overcome the plague. A particularly voracious species has appeared in the Bodirum District (Smyrna), and the whole population is employed to combat the insects. At Angora all business was suspended for three days by order of the Governor-General, and all the inhabitants were ordered to march out into the fields to destroy the grasshoppers. Every inhabitant was compelled to deliver twenty oka (about fifty-six pounds) of dead grasshoppers to the officials. The swarms are said to emanate principally from Persia.

Remarkable Swarms of Dragon Flies.

In some parts of Germany dragon flies have been unusually numerous. At Kamenz, during the last days of May, enormous swarms of them, here and there in dense masses, and extending from five to ten miles in breadth, passed over the valley. The first swarm arrived about noon on May 30; its passage occupied two hours. In the evening a second swarm came from the direction of Weisswasser. The third swarm arrived on the morning of the 31st. Swarms of this description have not been observed since June, 1825. At Dresden the strange phenomenon was also observed.

Supposed New Species of Horse.

M. Poliakoff, the distinguished Russian naturalist, has examined a horse presented by Colonel Prejvalsky to the St. Petersburg Academy, and decides it to be a new species, which he has named *Equus Prejwalskii*. It appears that the new representative of the family of undivided-hoofed mammals is in some respects intermediate between the domestic horse and the wild ass, but it differs from the asinine genus in having four callosities, one on each leg. In the form of

skull, absence of dorsal stripe, and other particulars, it resembles the domestic horse. This newly recorded animal is indigenous to the plains and deserts of Central Asia, and has not hitherto fallen under the dominion of man.

EARTH STARS.

Among the curious and interesting things that one fond of rambling over the sand dunes of Coney Island will meet with are the earth stars.

Nothing can be more puzzling to one unacquainted with such matters than to find a star-like plate lying flat on the sand, or with its points curved, as in Fig. 1, and bearing on its center a more or less globular body. At first sight we

Fig. 1.



Fig. 2.

**EARTH STARS.**

would take it to be almost anything else than a plant, yet it is a plant, and a very interesting one, belonging to the vast class of fungi. Most persons are quite familiar with its near relatives, the puffballs, which at first are round masses of a white puffy substance, and later a globular membrane filled with blackish dust, which passes out on the slightest touch in smoke-like puffs. Each puff of this dust is made up of millions of minute spores, which serve to multiply the plant, and serve the place of seeds.

The starry puffball in its early stage would readily escape notice or be taken for a small common puffball, and, like that, is attached to the earth. Unlike the common one, our starry puffball has a thick papery or leathery outer skin, which, at the proper stage of development, bursts in a somewhat regular manner and exposes the puffball portion, the star-like envelope remaining attached. We sometimes see oranges peeled for table decoration in a manner that reminds one of the earth stars.

The outer skin bursts with such force as to throw the plant several inches away from the place where it grew; hence it is rarely that they are found attached to the earth where they grew.

The central puffball gives off clouds of spores in the same manner as its larger relative. This portion sometimes sits

menhaden, some 125 miles off Absecom Light. When this turtle was first sighted it was fast asleep on the surface, evidently taking a sun bath.

After surrounding it with a "purse" net, a second and third net had to be used before the powerful reptile was securely entangled, so rapidly did he tear the nets asunder with his powerful fore and hind flippers. A crane was rigged on the deck of the steamer, by which means the turtle was carefully landed on the deck and brought to New York city to be sold—two amateur showmen of the market being the purchasers at \$250, though Mr. Starr, of Bunnell's Museum, shortly afterward offered \$300 for it. Under a canvas on the Fulton Market slip it reposes on a platform, where it is "bountifully fed on water melon rinds and butter-fish," as the showmen state.

This curious and very interesting animal is well worth seeing, as this one is the first living specimen that has been brought to New York since the one was captured off Long Island Sound, September 7, 1826. The one at the market will weigh in the neighborhood of 2,000 lb., and measures over 7 feet in length, is 43 inches broad, 3 feet thick, and the flippers are 47 inches in length, which, without doubt, ranks it as the largest living turtle ever brought to the Fulton or Washington market.

At the Berlin Fisheries Exhibition the United States Fish Commission exhibited in the collection of American turtles one of the finest specimens of the leathery turtle ever captured on our coast, and which was acknowledged to put Yankee-land ahead on the turtle question.

In color the skin or the shell of the leathery turtle is of a deep blue-black, and shining, reminding one of polished leather or black vulcanized rubber. About the throat are numerous mottlings of light blue spots. In place of the usual shield of horny plates that are to be found on all turtles, this variety is covered with innumerable small plates about the size of a ten-cent piece, which are situated under the leathery skin.

The upper shell, as will be seen by the illustration, is of a peculiar form, being composed of nine keel-like longitudinal ridges. The central and most prominent one, situated on the top of the back, is the highest. These dorsal ridges are all more or less scalloped, and are of a dirty bluish white. The front and hind flippers of this turtle are very stout and powerful and destitute of nails; in general form they are fin-like and capable of driving the animal through the water with great speed and force. The inside of the throat is lined with sharply tipped spines which point inwards, so that whatever enters has of necessity to be swallowed. The stout neck supports a large and massive head with strong and powerful jaws, the upper one being provided with notches, into which the sharp hook or beak of the lower jaw fits.

This turtle is undoubtedly an inhabitant of tropical waters, and is probably brought to our waters by the action of the Gulf Stream and other ocean currents.

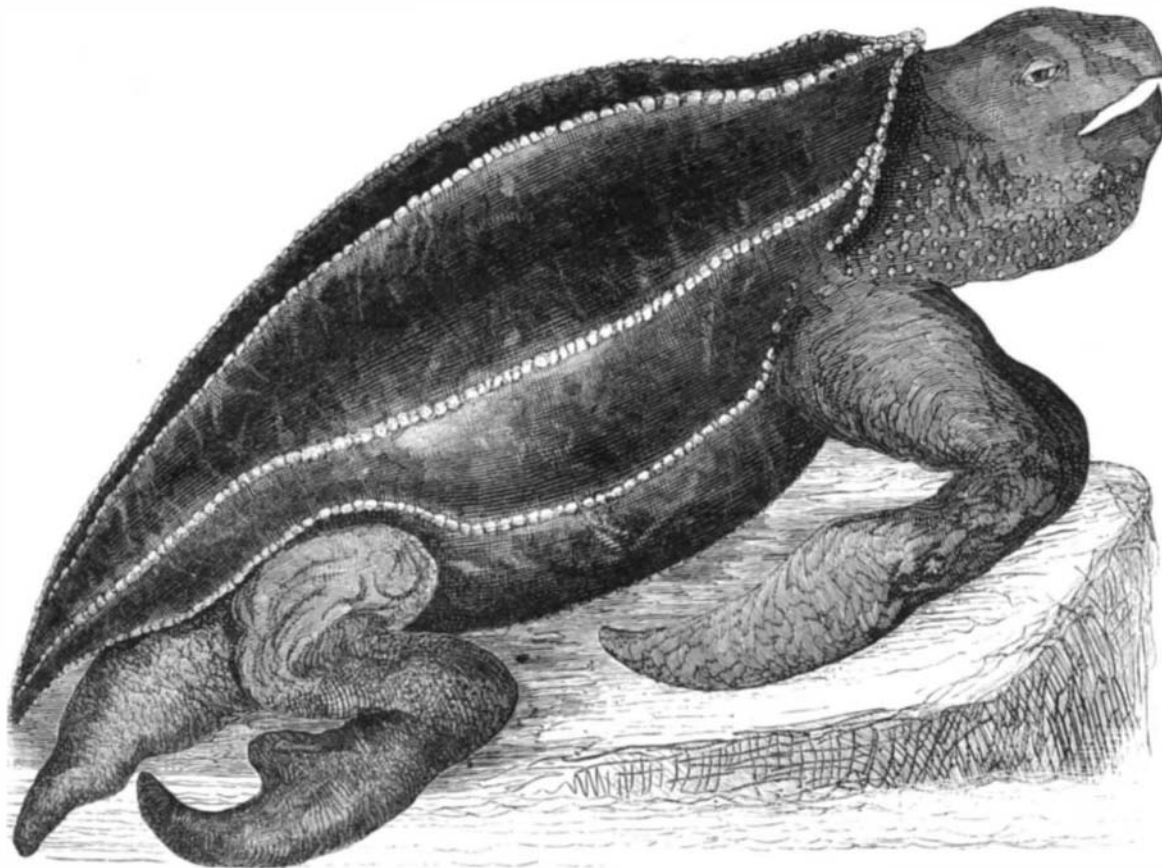
The immense size and weight of this turtle would render it a prize indeed to any lone and poorly-paid fisherman who might run across a specimen once in a while, were it not that the flesh is poisonous when eaten and produces severe sickness.

The food of the leathery turtle consists of the larger and coarser varieties of marine plants, such as the gulf weed and laminarias. The shells of these turtles have often been used for small boats, as well as drinking troughs for domestic animals and bathtubs for children.

The habit of the leathery turtle is much the same as that of the green turtle, logger-head, and hawk's-bill turtles. When sleeping or resting it floats on the surface. When feeding it is capable of remaining under water a long time before rising to the surface for a fresh supply of air.

A large specimen, which was captured in Massachusetts Bay, in 1824, when asleep and basking, was sold for \$200 to the New England Museum.

The largest specimen ever exhibited in this country was one that measured over 10 feet; this was lost at the burning of Barnum's (old) Museum. This one was captured off Sandy Hook, in 1816, which, including stuffing, setting-up, etc., cost Peale, the founder of the American Museum, afterwards Barnum's, \$400. The first recorded specimen taken on our coast was in 1811. From 1811 to present date, some thirty specimens have been caught, most of them having been secured by the Smithsonian Institution, so that an animal of such uncertain occurrence must be considered very rare. The leathery turtle, like all other deep-sea turtles, never visits the shore except during the breeding

**LEATHERY TURTLE.**—*Sphargis coriacea*

directly upon the center of its starry shield, as in Fig. 2, or is raised above it upon one or more short stems. The genus is named *Geaster*, which means earth star. There are eleven species in Great Britain, and only about six recorded for this country. During the hot, dry weather the earth star closes up, as shown in Fig. 2, but after a rainfall or during a heavy fall of dew the star slowly expands, and assumes the position shown in Fig. 1.

A THREE HUNDRED DOLLAR TURTLE.

A magnificent living specimen of the so-called "leathery turtle," also "lyre turtle," and "trunk turtle," and *Sphargis coriacea* of the naturalists, was captured last week by Capt. Hines, of the fishing steamer Humphrey, while cruising for