

mart where sales are effected. It is a village of brawny Vulcans, the clink of whose hammers resound from morn till night among the surrounding hills. Its position is somewhat romantic. High hills ascend on the right and left; white cottages peep out from among green bowers on the elevations, and the Farmington river winds through the valley, sometimes sleeping in the sunlight, and again dashing in foam over crag and jutting cliff. A very strong bridge stretches across the waters, and unites both sides of the river by a good roadway. Although confined by mountains, Collinsville cannot be prevented from expanding east, west, north and south; and as the business is a staple in its character—a useful and permanent one—of course, Collins' axes and Collins' hoes will always be required while forests have to be cleared and corn grows.

PHENOMENON OF THE FROZEN WELLS.

It is not only by her gold diggings that Vermont is just now attracting special attention from the outside world. The frozen well at Brandon is a great natural curiosity. It is situated on a gentle slope of ground, which rising on one side falls off on the other so moderately it may be called tolerably level. The soil is of a hard, compact, gravelly nature. The region round about furnishes marble (carbonate of lime) in abundance. Early in November last, Mr. Alexander Twombly commenced digging a well, and after going down about twenty-five feet without noticing anything unusual in the character of the soil, he came upon frozen ground (the surface earth at the time was frozen but a few inches). Continuing downward through this frozen earth for fifteen feet, he came to water. The soil, just at this point, he describes as yellowish and sticky. The water commenced freezing over soon after it was exposed. The well was stoned up three feet in diameter at the bottom, diminishing two feet at the top. The depth of water is five or six feet, the surface of it forty-one feet from the top of the ground. During the past winter the water froze over it so that it had to be cut by a person going down into the well every day, and some days the descent had to be made several times. The ice in the morning would often be three inches thick. In addition, the sides of the well, for a distance of fifteen feet above the water, would be encased with ice. The water ceased freezing over about the 15th of May last. The condition of the well on the 15th instant, when we visited it, was this: The water in the well is enclosed in a wall of ice six to eight inches thick, inside the stone wall, but not rising above the surface of the water, and affording a good foothold to a person once down there. For six or eight feet above the surface of the water the stone wall is encrusted with a layer of frost and ice, not thick. The water is clear, cold, and tastes well; it is not very "hard." The above facts proven, how shall the phenomenon be explained? The causes lie evidently in some peculiarity of the soil in that locality. Suppose we take into consideration several well-known facts. Chloride of calcium, with snow or ice, forms a powerful frigorific mixture. This chloride is formed by a union of carbonate of lime (marble) with muriatic acid, which is made from common salt. Chloride of calcium exists in solution in ocean waters, and also in certain spring waters, commonly in union with salt and chloride of magnesium. As before stated, the region about the well abounds in marble, or carbonate of lime, and quite likely this water may be from one of the springs saturated with chloride of calcium which snow or ice will form one still more powerful; why may not the chloride, supposing it to be present, with salt, perhaps suffice to freeze water, naturally cold by reason of its depth from the surface? If it is claimed that frigorific mixtures do not solidify, may not the above ideas point the way in which to look for a probable solution of the mystery?—*Springfield Republican*.

[If the conclusions of our cotemporary are correct, the fact can be demonstrated to perfection by an analysis of the water. But without taking the trouble to do so, it is our opinion that the chloride of calcium in the soil is not the cause of this ice phenomenon in the frozen wells of Vermont, because, if this were the case, the waters could not be used on account of their intensely bitter taste. The chloride of calcium has a very great affinity for water and is very soluble; now, as our cotemporary makes the statement that the waters of this well are not bitter (they taste well) and not very "hard," they surely cannot contain much, if any, chloride of calcium—not enough, we think, to produce this freezing phenomenon. It has been reported that Dr. Jackson, of Boston, has visited this well, and will make a report of his examination at the next meeting of the American Association for the Advancement of Science.—Eds.]

WILCOXSON'S STEERING APPARATUS.—We have to state, in addition to what we published last week, that the above apparatus is made with one screw as well as two for smaller ships, and the captains of some lake schooners, who have them in use, say they are the best steering apparatus they have tried.

TUNGSTEN STEEL.

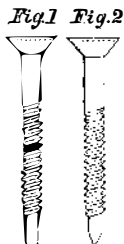
We have noticed a paragraph in the columns of several of our cotemporaries to the effect that the German metallurgists have discovered that the metal "tungsten" mixed with steel, in the proportion of eighty of the latter and twenty of the former, forms a very valuable alloy, harder even than steel itself. They also state, that in consequence of this discovery, old tin mines that have been worked out will be again brought into use for the sake of their tungsten ores, that were heretofore considered valueless.

It is not stated who the metallurgists are that have made this discovery, but we suspect it is not of so much importance as is stated. When it is said that tungsten makes an alloy harder than steel itself, the expression is too indefinite, because steel can be made quite soft, and from that point made to every degree of hardness, up to engraving on glass, like the diamond itself. To make steel harder than can now be done is scarcely a desideratum, and unless tungsten imparts to it some other qualities, it will never be much employed as an alloy.

The ores of tungsten are very scarce in our country. In combination with iron it is called wolfram, and is found in Monroe, Conn., and one or two other localities. No use of this metal has hitherto been made in the arts.

A BRAD-AWL SCREW.

Alexander Pilbeam, of London, is the inventor of the screw which the accompanying illustration represents, Figs. 1 and 2 are side-views of the screw, the ends of which terminate like a brad-awl; in use it merely requires to be stuck with the hammer to drive the brad-awl fast into the wood, and then the screw-driver, applied and it will be found to enter the wood as quickly, if not quicker than the ordinary screw (which requires a hole to be made for it first) and is much more secure. As the fibers are broken away by the brad-awl part, they arrange themselves between the threads of the screw; and it will also be seen that, by being able to use the screw direct, one half of the labor is saved. They can be made of all sizes, and applied to hooks, studs, and rings, and anywhere that a screw is necessary.

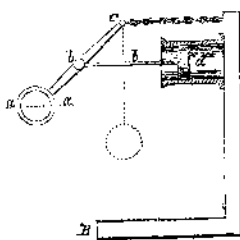


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PHOTOGRAPHIC PORTRAITS AS SIGNS.

The following interesting decision was lately given in England:—A Mr. Mills was charged with wilfully destroying two portraits and the glass of the case in which they were exhibited on the street; damage, two guineas. One of the portraits was that of defendant's wife. The defendant expressed his annoyance at his wife's portrait being exposed to public view; and added that he had protested against it, and requested it might be withdrawn. His request was not noticed, and he certainly did destroy it, as stated. Mr. Broughton, magistrate, gave judgment. Whether an artist, an ale-house keeper, and any other people, all being alike to the law, might, after notice, seek to attract customers by hanging up a portrait of his neighbor's wife as a sign, was at least very questionable; but even if the exhibition was a nuisance, which the law would abate, it was clearly unlawful for the defendant to redress his grievance by violence. He must, therefore, pay for the damage done; but, inasmuch as the exhibitor was entitled to no sympathy, the amount must be limited by a rigid estimate.

PROBLEM IN DYNAMICS.—A correspondent takes the accompanying figure from the *London Engineer*, and puts this interrogation to us:—Suppose the piston, *d*, to be pressed by a force of two tons, and the lever raised to an angle of 45° from its perpendicular, what will be the weight of *a a* to balance the force in the cylinder, and also the forces on the horizontal lines *a a*, *b b* and *c c*; *B* being the base? Answer: Weight, two tons; force on line *a a*, one tun; force on rod *b b*, two tons; force on line *c c*, one tun.



line *a a*, one tun; force on rod *b b*, two tons; force on line *c c*, one tun.

THE Fourteenth Annual Fair and Cattle Show of the Chenango County Agricultural Society will be held at Norwich, N. Y., September 20th, 21st, and 22d.

AN INTERESTING ESTABLISHMENT.

During a recent visit to the great metropolis, we had occasion to admire the elegant fire-proof building whence issues the *New York Daily Times*. Adjoining this superb edifice is an immense brown-stone structure, one of the finest in the city, which forms a sort of religious, scientific, literary, and political center; as from it issues weekly the *New York Observer*, the *Century*, and that well-known and deservedly-popular journal, the *SCIENTIFIC AMERICAN*. It also contains the editorial-office of that excellent Democratic journal, the *Daily News*.

We were very much interested in visiting the offices of the *SCIENTIFIC AMERICAN*, which are the finest of the kind in the world. Here we found Messrs. Munn & Co., with a large corps of scientific persons around them, preparing matter for their journal, and executing drawings and specifications for new inventions previous to taking out Letters Patent. We had no previous idea of the extent of their business in this line. They have the finest collection of mechanical models outside of the Patent Office. It is altogether a curious and interesting place, and is well worthy of a visit from every one. These gentlemen have recently issued a very neat pamphlet of advice to inventors, which they circulate free.

[We clip the above item about ourselves from the *Hartford (Conn.) Daily Post*. We have to thank our friend Scofield for discovering us while on his visit here; we enjoy such notices very much.—Eds.]

SLEEP OF PLANTS.

Plants sleep as well as animals; the attitude that some of these assume on the approach of night is extremely interesting to those who delight to study the beautiful phenomena of vegetable life. Some plants exhibit signs of sleep more marked than others. The leaves of clover, lucerne, and other plants close as the sun approaches the horizon; and in the honey locust this characteristic is particularly striking and beautiful. The delicately formed leaves close in pairs at nightfall, and remain so until the rising of the sun in the morning, when they gradually expand to their fullest extent. It is in common garden chickweed (*stellaria medica*) that the most perfect exemplification of the conjugal love and parental care of plants is observed. At the approach of night the leaves of this delicate plant, which are in pairs, begin to close towards each other, and when the sleeping attitude is completed these folded leaves embrace in their upper surfaces the rudiments of the young shoots; and the uppermost pair (but one) at the end of the stalk are furnished with longer leaved stalks than the others, so that they can close upon the terminating pair and protect the end of the shoot.

STOCKS OF RIFLES.—A patent has been taken out in England, by G. P. Evelyn, for an improvement in gun-stocks, called "the under-arm gun-stock," which we think deserves the attention of our gunsmiths, as it is an application of art in a direction which has been overlooked in a great measure. The new gun-stock is capable of being modified to suit various descriptions of fire-arms, and its object is the attainment of the following results: First, it is adjustable, so that persons of various heights, length of arm and neck, are enabled to use the same weapon with equal facility; second, it is arranged so as to avoid lowering the head in taking aim, and thus it ensures greater accuracy. Our gunsmiths seem to have no fixed principles to guide them in the construction of gun-stocks. This is an inviting field for improvement.

LONDON TRICKS OF NATURAL SCIENCE.—It is stated in one of our London cotemporaries that a number of persons in that city earn their livelihood by painting common birds to represent some rare and foreign sort, or who invent non-existing breeds. The more outlandish a bird is made to look, the more chance there is of selling it. A vulgar rat was once transformed into an elegant microscopic dog for a lady's pet; for a few weeks the little quadruped enjoyed the care and caresses of the admiring mistress, till the growth of its claws enabled it to take a promenade by means of the curtains to the ceiling.

RISE IN THE WORLD.—As an evidence of what industry and perseverance will do, it may be stated that the Hon. Solon Borland and Hon. Jere Clemens have risen, by successive stages, from United States senators and ministers plenipotentiary until they have reached the editorial chair; and they are now associated in the management of the *Memphis (Tenn.) Enquirer*.