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Pressure of the Ocean.

A correspondent—L. W. Trask, of Hitchcockville, Conn.—sends us an extract published by a cotemporary on the above subject. The article in question treats of the compressibility of water, and states that at the bottom of the ocean, it is scarcely, if any, denser than at the surface, and from this the conclusion is drawn in the following words:—"It is just as easy, therefore, to move through the water at the bottom of the ocean as it would be at the surface." Our correspondent objects to the correctness of this conclusion. He says:—"From my own experience as a submarine diver in both salt and fresh water, I know that this is not so. In a depth of 100 feet of water, a diver moves only with difficulty. This I know is true, and all the divers with whom I have conversed on the subject and the number is not small—have experienced this difficulty of motion under water."

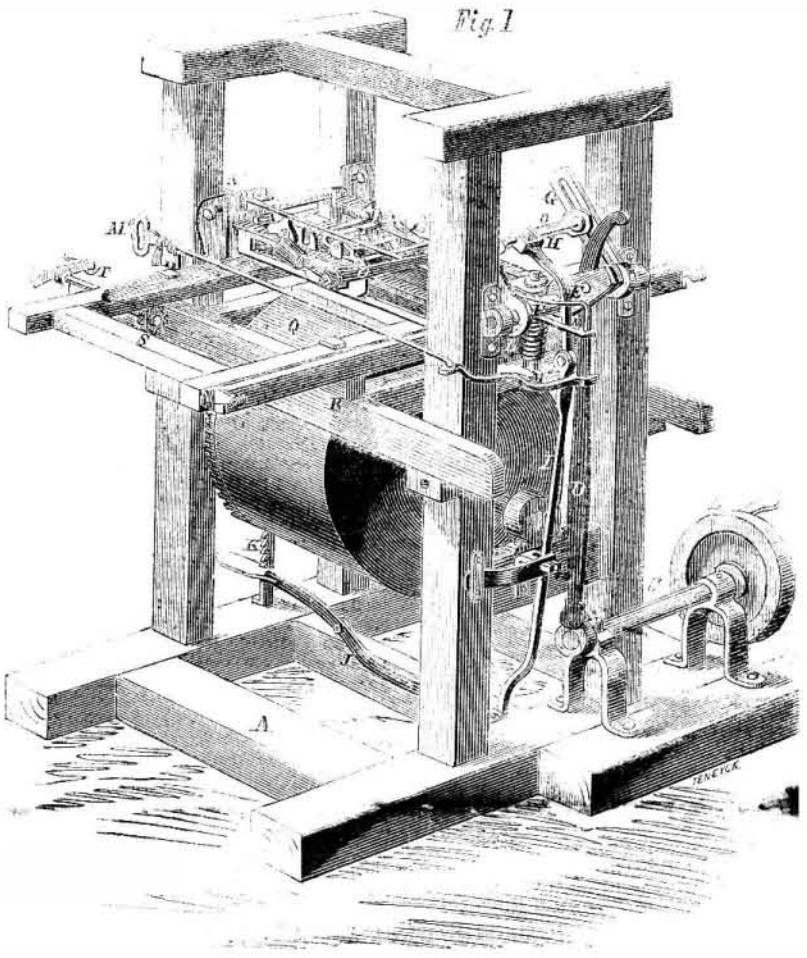
Our correspondent's practical experience accords with that of every person who has dived only to the depth of ten, twelve, or sixteen feet, as we can also testify, and his experience also accords with the deductions of science. Water is, indeed, but slightly compressible; but at the depth of six miles in the ocean, it must be more dense than at the surface, because at that depth the pressure on the square inch is about 7,000 tuns. At the depth of 100 feet, the pressure is 43·40 pounds on the square inch, and a diver, at this depths (although the pressure is equal on all sides) must experience more difficulty in moving about than when at the surface, where the pressure of the atmosphere is only 15 pounds on the square inch.

Peculiar Bricks.

Bricks which are glazed on the outside are unfit for building purposes, because they cannot be cemented by common mortar, and therefore require to be porous. But this porous quality involves another evil, namely, that of absorbing moisture, hence brick walls in wet situations or when exposed to severe rain storms, become very damp. Could bricks be so made that their inside would become glazed or vitrified, they would prevent the absorption of moisture, while at the same time they would be perfectly adhesive. We learn by the London *Builder* that such bricks have recently been made in that city by Wm. C. Forster, and that he has taken out a patent for them. It is not stated how they are made, but we can easily divine a method for accomplishing this, namely, by placing some flux, like borax or soda, in the heart of each brick, whereby the interior will become vitrified, with a heat much lower than that of the outside. Such bricks cannot be made so cheaply as the common kind, but for some purposes it may be well to manufacture them even at considerable extra cost.

ARNOLD'S HIDE SHAVING MACHINE.

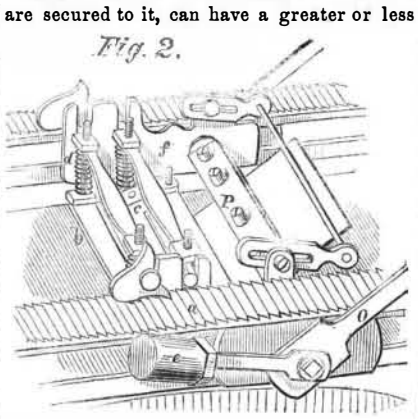
Fig. 1



Despite the croaking of a certain school of philosophy, the battle cry of which is "the times are out of joint," there is still some skill left in the world, and mankind is not quite so bad as on the surface it would seem to be. The inventor of the machine which is the subject of our engraving—Horace L. Arnold, of Elk Horn, Wis.—is an illustration to the point. Once upon a time he was full of enthusiasm on the subject of rotary engines, but by our advice he turned his attention to the invention of things more feasible and really useful; the consequence is that he has invented a car seat and couch, and the excellent hide shaver we are about to describe. In his letter to us he says:—"Please accept my most sincere thanks for your efficient aid in this matter, nothing could tempt me to apply for a patent through any other agency save yours. To you I am indebted for saving me from devoting my best years and all my means to the rotary engine, and for important information very many times, as well as for the choicest mechanical literature weekly in the SCIENTIFIC AMERICAN. I shall always be grateful to you." When such letters as this come to us from all parts and persons, we cannot but believe that if "the times *are* out of joint," it will not take much to put them in again, and by spreading information broadcast over the land, we try to give a helping hand to that good work.

This machine is intended to shave hides, and it will cut a shaving of uniform thickness from the hide, following its inequalities, or it will cut shavings so as to reduce it to a uniform thickness throughout. A is a frame, power being received by the working parts from the wheel, B, and a shaft, C, that by a crank, gives an up and down motion to the connecting rod, D. At the top of D there is a slot that catches on a pin, E, in the double arm that projects from the shaft, F, to which is attached the slotted arms, G. By this means, the arms, G, receive a reciprocating motion in an arc of a circle. The rod, D, works in a guide, M, that is connected to a rod and handle, M′, by which the workman can throw it in and out of gear with E, so as to move F, and the cutter moved or not as desired without stopping the motion of B and C. In the grooves of G a rod, H, is capable of sliding so that the connecting rods, O, that are secured to it, can have a greater or less

Fig. 2.



length of stroke imparted to them, and H is moved in the grooves by the rod, I, that is connected to the lever, J, which the workman operates by his foot and secures in the proper position by the rack, K, a spring pressing against I tending to keep it in the rack, and facilitating the back motion of G. The cutter will be better seen in the detached view, Fig 2, it is moved by the rods, O, on the toothed ways, *a*, that can be raised or lowered to regulate the thickness of the shavings, by the screws, L, one at each end, that are operated by the nuts, N, and the crank-rod, N′. The cutter or knife, P, is attached at its center to the frame, *f*, and by a cross-bar at its end can be secured at any desired angle, and there is a grooved piece in front, *c*, through the grooves of which the knife passes, making it into a kind of spokeshave or plane when necessary, as for harness leather; this is kept on the leather by springs and allowed to play by being in open grooves in the frame, *f*. A rubber, *b*, is kept down and allowed play in the same way, *d*, being the springs; this rubber has cams on the ends of its upper bearing which in the return stroke catch in the teeth of *a* and lift it off the leather when the knife is not cutting. A weight, *e*, is secured to a lever on the shaft of P which keeps it on the leather and makes it cut. The hide is secured to the frame, S, by the clamp seen in the front of it, and allowed to lay on a flat table on one part of the drum, Q, the curved periphery of which can also be used when necessary. The frame, S, can be moved back and forth (by the hand crank, T,) upon the frame, R, which moves on A (by a hand-wheel and gear not seen) together with the drum, Q, that slides upon its shaft. The hide can be clamped upon Q, which can be rotated to bring every part of the hide under the action of the knife. The whole machine is remarkably simple, and all the parts are under the enable control of the operator who has not to change his position to perform any change that is required; and the hide is as thoroughly shaved, unhaired or fleshed, as if done by hand, without the fatigueing labor or loss of time. We have described it sufficiently minutely to enable all to understand it, and our readers will at once see its many and great merits. It is compact, simple, and efficient, and any further particulars may be obtained by addressing the inventor, as above.

Instruction and Science for the People.

The government of Great Britain has a department of science and art which takes charge of a school of art, where the best masters teach at a trifling cost to the student, and where all the facilities of a picture gallery and models are afforded; and it also cares for a museum of geology and mining school, a college of chemistry and a technical museum.

During the winter months, the professors give courses of six lectures to the working men, on their special branches of knowledge, and the charge of admission is but 12 cents, to each course, thus placing information of the truest kind within the reach of all. By them, the brilliancy of an experiment or illustration is never thought of, its aptness being their only care, and as the audience go to the lecture room to learn, and the professors to teach such secondary considerations are dispensed with, and yet the lectures are by no means *dry*, on the contrary they are very pleasant, for each lecturer being fully imbued with the spirit of his subject, he cannot fail to be always interesting and entertaining. Will not some of our well-known philanthropists endeavour to arrange for courses like this by the next season? Cheap and good, it would be a novelty for which they would receive the gratitude of thousands. Prof. Wagner of Philadelphia gives *free* science to the people; why cannot our other cities have it at least accessible to all We give them some to read, who will give them some to hear?