New Inventions.

The Temperature of the Ocean.

A correspondent of the *Evening Post*, this city, writing on this subject, endeavors to prove that the entire volume of the ocean must be about a temperature of 39°, and Lieut. Berryman's deep sea soundings (which have been noticed in our columns) by which a temperature of 20° below the freezing point was found, are attributed to a defective instrument. We have received a letter which will appear in our next number, in which facts will be given in proof of the correctness of Lieut. Berryman's soundings.

New Double Stars.

In the transactions of the Royal Astronomical Society of London, lately published, Mr. Alvan Clark, of Boston, Mass., celebrated for his skill as an astronomical instrument maker, is paid a high compliment by the Rev. W. R. Dawes, for his astronomical discoveries, especially of new double stars. Regarding one of these, he says, "This star is about as difficult as the closest of the Poulkova catalogue, and though on a fine night visible with the eight-inch object glass I now have in use, it would require the full power of a fifteen-inch refractor to divide it. That it attracted Mr. Clark's attention as a double star, is sufficient to prove that his eye, as well as his telescope, must possess extraordinary power of definition." This was accomplished by Mr. Clark with an object glass whose aperture is only seven and three-quarter inches.

SHAW & CLARK'S TANNING APPARATUS.

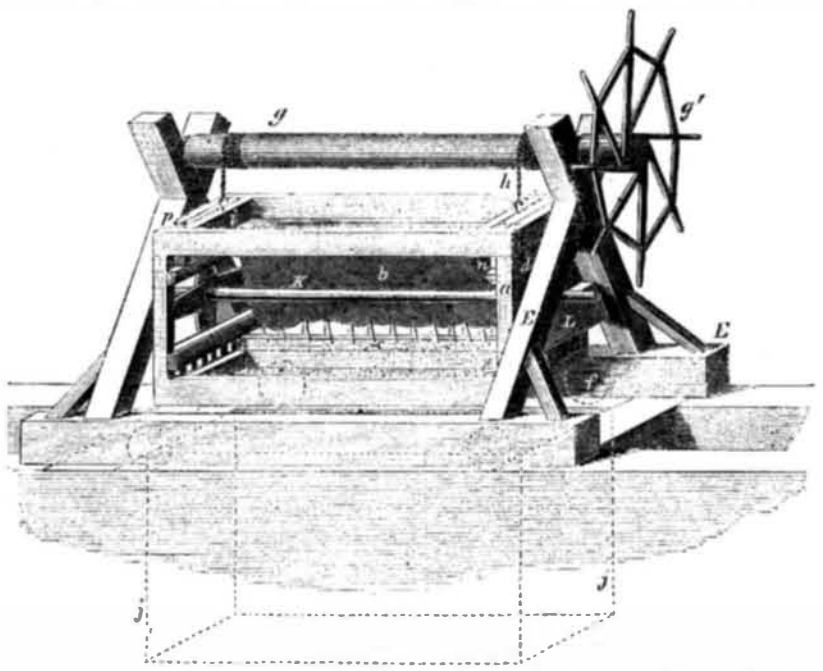
Improved Apparatus for Tanning.

Our illustration represents an apparatus invented by Chas. A. Shaw and James Clark, of Biddeford, Me., and patented by them Jan. 26, 1858, for the purpose of giving the operator a more perfect control over the skins in the process of tanning, and for obtaining many other advantages which will be seen as we proceed in our description.

In the accompanying engraving, *a* is a strong framework or false vat, having two open sides, and made to fit exactly the real vat, *j*, in which the hides or sides, *b*, to be tanned are firmly secured in the sticks, *c*. These sticks are supported at each end by the horizontal rests, *d*, which are strongly bolted to the inside of the ends of the framework, *a*, at a sufficient distance only from the side of the frame to freely admit the sticks, thus keeping the sides fully extended while in the frame. E is a frame, so constructed as to be easily removed from one vat to another upon the trucks, *f*, shown in dotted lines, having a windlass *g g'*, on the top, by means of which and the ropes, *h*, and hooks, *i*, the false vat, *a*, can be raised from or lowered into the tanning vat, *j*, in which the tanning liquors are contained. K is an adjustable axle or pole passing through the center of the frame, *a*, longitudinally, and supported by the cross-pieces, L, on the frame, E; this axle is used to support the frame, *a*, when it is raised entirely above the vat, *j*, and is that on which *a* is rotated to change the position of the hides, *b*, after they have been in and out of *j*; it is removed when *a* is again lowered into *j*. Toothed projections, *n*, are attached to adjustable bars, so fitted between the side bars of the frame, *a*, which make its longer axis, that the teeth, *n*, pass between and keep at an equal distance the sticks *c*, just as well, whether the hides are in a vertical or horizontal direction. These bars are adjusted and fastened in their places by the hasps, *p*, after filling the frame, *a*, with hides, completely securing the sticks, *c*, at such a distance from each other as to freely admit the tan liquors to the hides, and at the same time keep them all in a proper position in the frame, *a*, when it is rotated on the axle, K.

The hides are prepared for the frame by being spread upon a large table perfectly smooth, and on it they are attached to the sticks, *c*, which are kept the proper distance apart by stationary upright pins in the table. The back of the hide is first firmly fastened with small nails to one stick, and then laced to the other.

In this manner the operator has perfect control of his work, and the hide can easily and quickly be prepared in the frame, *a*, where they are kept fully stretched and an equal distance apart, in the best shape to receive the full action of the tanning liquors, when the false vat, *a*, is full of hides properly arranged,

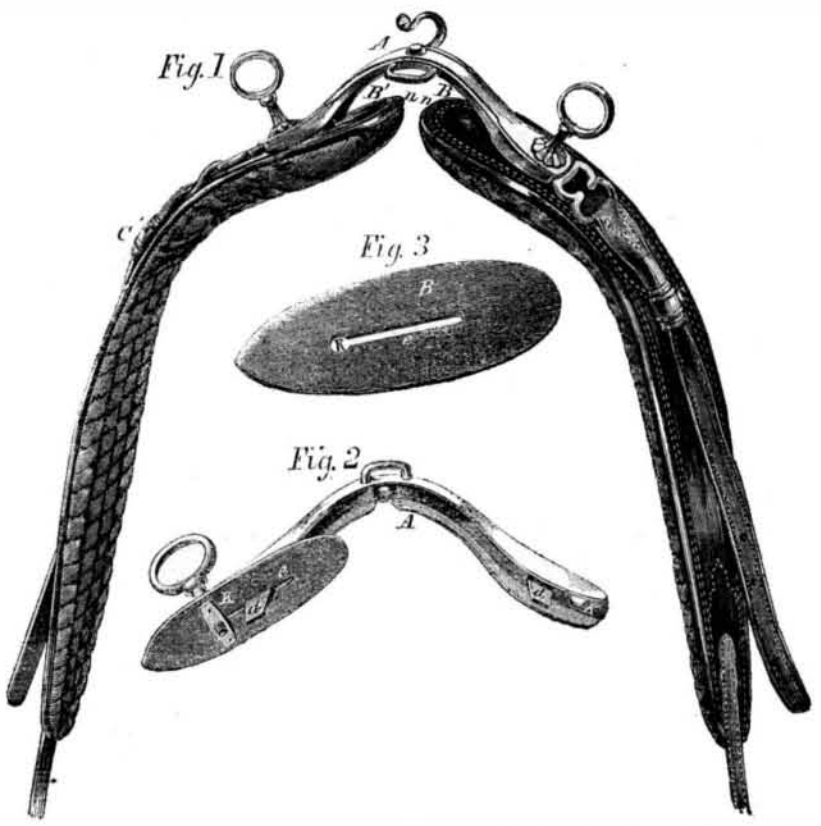


other and from one vat to another, *a* is drawn up and the frame, E, moved to the desired vat by means of the runners, *f*. In order that the frame may be equally balanced, in filling it, sides are put in alternately with a neck and a butt at each end.

Among the peculiar advantages of this mode of tanning may be noticed, the improved appearance of the grain of the stock produced by keeping the hide perfectly smooth and extended while in the liquors; also the great gain in the weight by preventing the destruction of the gelatine, and saving of time in producing stock, due to having the hides constantly and perfectly exposed on all sides to the liquors, and to subjecting all portions of the hide successively to the action of the strongest liquors at the bottom of the vat, and lastly, the ease and facility with which a whole pack of hides can be handled at one time or changed from vat to vat.

Messrs. Shaw & Clark will be happy to furnish any additional information that may be desired on being addressed as above.

DEMPSEY'S IMPROVED HARNESS TREE.



Harness trees which have to bear the weight of the shafts must be made sufficiently strong to hold up the shafts, and at the same to so adjust the weight as not in any way inconvenience or chafe the horse. The harness tree we are about to describe fulfils these conditions, but is applicable only to light carriages and coaches, and not to saddles of any kind. It is the invention of Thomas Dempsey, of the firm of O. Macfarland & Co., harness-makers, Newark, N. J., and was patented by him Jan. 12, 1858.

In our engravings, Fig. 1 represents a light carriage harness tree, having the improvements attached. These improvements consist in forming a metallic tree, A, with its center raised an inch and a half more or less from the top of the horse's back, in order to allow sufficient room for the spring pads, B B', to move up or down when operated by the horse's back, and not its sides. The springs in the pads, B B', can be operated only by a *direct vertical* pressure, and thus any strain or sudden jar coming upon the tugs, C C', operates the springs, B B', and thereby relieves the horse.

Fig. 2 shows the metallic tree, A, and the spring of the pad, B, the other spring being removed to show the tongue, *d*, more fully. The tongues, *d*, are cast upon the tree, A, and serve to prevent the pads from getting out of place, and yet leave them perfectly free to move up or down by means of slits or openings, *e*, seen enlarged in Fig. 3, which shows the spring enlarged. These flat plates or springs are tempered from the terret nut, K, to the points, *n*, only. The terret nut, K, is attached to the flat pad or spring as seen at Fig. 2, and the spring is secured by the terret to the tree in such a way that the tongue, *d*, cannot get out of the slit, *e*, until the terret is unscrewed, however flexible the springs may be. The arrangement of the pad springs, B B', secured by means of the combination of the terrets and tongues, and the tongues forming a part of the metallic tree, and arranged as in this invention to *give* to the motion of the horse's back, is new, and altogether it is a very good and easy harness tree.

Any further particulars will be furnished by Mr. Dempsey, on being addressed as above.

Evaporative Power of Brass, Copper, and Iron Boiler Tubes.

A late number of the London *Mechanics' Magazine* contains an article on the above important question, by W. G. Tosh, from a paper read by him before the Institution of Mechanical Engineers at Manchester, England. He constructed small vertical boilers of equal dimensions, and placed in the center of each a single tube, two inches in diameter, and of No. 14 wire gage thickness. A gas flame was applied to each tube—iron, brass, and copper—successively, during a certain period of time, which was equivalent to the same quantity of fuel consumed in each case. The experiments were first conducted during the day, then at night, at times when there was little probability of a change of pressure in gas pipes. Eight of these were made with the boilers, and the quantity of water evaporated was measured by the number of inches it was lowered in a boiler by each experiment. The result was in favor of the greater evaporating power of the brass over the iron tubes, in the proportion of 125 to 100; that is, two pounds or two tuns of coal, or other fuel, will, with the use of brass tubes in a boiler, evaporate twenty-five per cent more water than iron tubes with the same quantity of fuel, under precisely the same circumstances. In the same proportion that brass surpassed iron in evaporative power, copper was found to surpass brass. The evaporative powers, relatively, of the three metals in tubes for steam boilers, he found were as follows: Iron, 100; brass, 125; copper, 156.

The experiments of Mr. Tosh were subjected to a searching criticism by the engineers of the Institution, and strong doubts were expressed as to their correctness. We give the results, in substance, as we find them, and enjoin some of our correspondents to make similar experiments, because it is a question of vast importance. If it be true that copper tubes in boilers will evaporate fifty per cent more water than iron tubes, no other kind of tubes should be employed, and no steam boiler should be constructed without copper tubes. In our opinion, too high an evaporative value was obtained both for brass and copper over iron; but this is a question which experiment alone can settle, and the sooner this is done correctly, so much the better for mechanical science.

It takes the pressure of 150,000 lbs. to punch an inch hole in an iron plate one inch thick.