

**APPARATUS FOR ADMINISTERING MEDICINE TO HORSES.**

As it is generally useless to attempt to persuade a horse to take medicine voluntarily, owing to his equine inability to appreciate its advantages, combined with dislike for the taste, mechanical means are sometimes resorted to, and an ingenious contrivance for the purpose is represented in the accompanying engraving. It consists of a wooden gag bit, which is placed in the horse's mouth and suitably attached to the headstall. By pulling the cord shown, the gag is turned by levers, compelling the animal to open its mouth. The stem of the medicine receptacle, which looks like an exaggerated tobacco pipe, is then inserted in a hole in the bit and clamped therein. Then, by opening a valve in the receptacle, the medicine previously placed in the bowl runs down the horse's throat. Also in the stem is a kind of fork, which, when a pill is to be administered, holds the same until it is washed down by water poured into the bowl.

This device was patented through the Scientific American Patent Agency, February 26, 1878, by Mr. Henry Hartman, of Camp Halleck, Elko county, Nevada.

**Apprentice Shops for the Boys.**

The necessity for more skilled labor is urgent upon the people of the United States, while at the same time the number of young men or boys who need the rudiments of practical pursuits is very large, especially in every considerable town in the country. To meet this want the establishment of shops for the production of numberless smaller articles is practical, and where the work should be chiefly done by boys without further compensation or expense attending their teaching and labor than that they shall receive an amount of instruction in the rudiments of knowledge, especially in the natural sciences and the knowledge pertaining to the practice of the trade they select to learn, and that they be apprenticed for a certain length of time without compensation, and for a compensation for a length of time afterward.

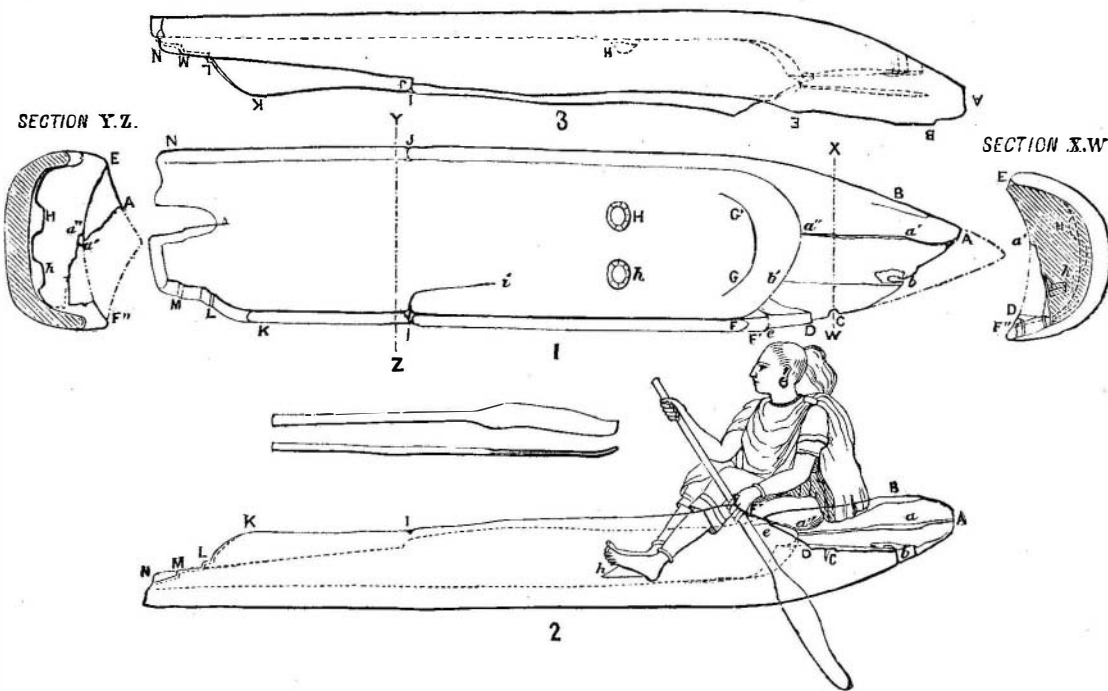
The shops in healthy locations and the confinement of the younger classes not greater than in schools; shops of this character fitted for woodworking by hand and by machinery, wood turning, carving, and moulding, and ornamental as well as useful, also for founding and fitting articles in cast, malleable, and wrought iron and steel, for metal working and the manufacture of useful and ornamental articles—these are especially practical, and with their establishment and the experience gained other shops would be from time to time established.

Why not a master workman be furnished with the small beginnings of a shop and take pupils to teach in special branches, as well as now teaching telegraphy, music, drawing, bookkeeping, or any of the special callings?

**A BOAT OLDER THAN THE ARK.**

During November last an association of boatmen, calling themselves Lacustrians, on account of their trade, being the exploration of the shoals of Lake Geneva in search of antiquities buried in the bottom, discovered in the lake, and near the town of Morges, the remains of a large ancient dug-out. The boat was buried in about fifteen feet of earth, and during its exhumation, owing to the great fragility of the old wood, it was broken in several places. It was finally transported to the museum at Geneva, and there rests submerged in water to prevent the corrosive action of the atmosphere. We take from *La Nature* the annexed engraving, exhibiting the construction of the oldest known vessel, the period of the making of which far outdates that commonly ascribed to the construction of Noah's Ark.

Fig. 1 is a plan, and Figs. 2 and 3 lateral elevations. The two smaller illustrations exhibit sections. It is probable that the two extremities terminated in points, but one end is badly ruptured, and the pieces could not be found. The length is about 15 feet, breadth 27 inches, and thickness of sides and bottom from 2 to 4 inches. The end, A E F F', is not dug out, and is rounded to form a seat. Near this and on the bottom are two projections, H h, evidently intended as stretchers for the occupant of the boat to brace his feet against while paddling. It is probable that the boatman, therefore, seated himself as shown in Fig. 1, facing the bow and using his paddle exactly as do the Indians of the present day in the propulsion of their canoes. The boat was hewn from the trunk of an oak, evidently with implements of stone or bronze.



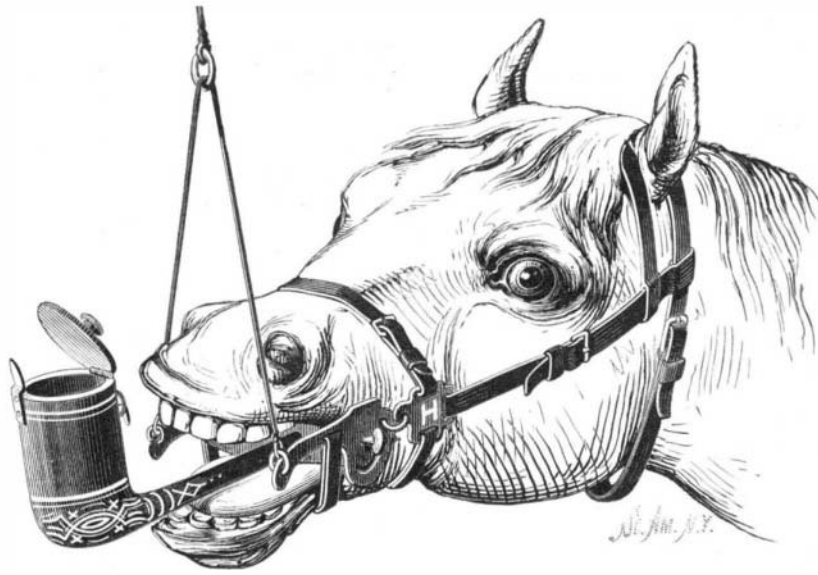
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**New Agricultural Inventions.**

Mr. Reuben O. Kinne, of Eldorado, Ill., has patented a new Grain Binding Attachment for reapers, which is so constructed as to bind the grain with straw bands. The construction is very ingenious, embodying ten new mechanical devices.

Mr. B. T. Timby, of Ridgeway, N. Y., has patented an improved Composition for invigorating trees and protecting them from insects and improving the fruit.

Mr. David Wolf, of Avon, Pa., has invented an improved



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Plow Point, which is reversible and invertible, and in other respects of novel construction.

The improved Harvester patented by Mr. William Ganger, of Mulberry, Md., Nov. 14, 1876, has been improved by him so as to simplify the construction, and so that the gavels may be dropped to the ground out of the way of the machine on its next round.

An improved Grain Separator has been patented by Messrs. William M. Redd and Erastus M. Sandford, in which the new feature is a cover suspended over the screen to hold the grains flat on the latter.

Mr. Orson J. Smith, of Farmer City, Ill., has patented a new Watering Trough, which has a detachable cover, or protector, having an inclined roof in which are formed openings to permit the stock to have access to the water, and to which boards are hinged for use in closing said openings when required.

A new Garden Hoe has been patented by Mr. Calvin W. Polen, of Hazel Dell, Ill., which is suitable for cultivating young plants in drills, and which may be adjusted to suit different distances between the rows, and to throw the soil to or from the plants.

Mr. Rease W. Workman, of Rock Hill, York Co., S. C., has patented a new Plow. The invention consists in attach-

**Employment of Ships against Forts.**

Admiral R. V. Hamilton, C.B., in a recent lecture before the United Service Institution, London, placed before his audience some very carefully collated and elaborate facts regarding the important work performed by the American navy during the Civil War in America, his purpose being to draw lessons for our own navy as to work which may have to be performed with ships and armaments "as yet almost untried in actual warfare." At the commencement of his lecture, Admiral Hamilton pointed out that owing to the exigencies and peculiar nature of the American Civil War, a very large portion of the naval work was done by ships and guns invented or adapted to meet novel modes of warfare, and he had no hesitation in saying that it was their naval superiority in the commencement which enabled the Northerners to penetrate the various rivers, creeks, and bayous in the heart of the Southern Confederacy. The navy, too, in several instances decided the fate of battles by the protection afforded by the fire to the wing of the Northern army resting on a river, as at Pittsburg, Lanburg, and Vicksburg, and the escape of Morgan's expedition in Indiana and Ohio across the river into Kentucky was prevented by a gunboat, which arrived at different fords in time to stop his men crossing. On the navy, in a great measure, also depended the supplies and transport of the army, but as these services were not as showy and interesting as the numerous battles between the conflicting armies, they were but little known or appreciated by the general public—a complaint, he need scarcely say, not peculiar to the American navy.

The lecturer described the positions on both sides on the commencement of the war, April, 1861, pointing out that the North held the ships, 42 in number, which then composed the American navy, a number which was increased by the following December to 264, and a year afterward to 427, while in 1864 the number was increased to 671. He dwelt upon the energy shown by both sides to obtain what was required, and from these facts he drew the moral—"That with the number of eminent firms we have in this country skilled in iron and ironclad ship-building our government have only to make up their minds what course they intend adopting in regard to attacking forts and other services of any nation we may be at war with, and be prepared to rapidly run up, as the Northerners did, light draught ironclads, adapted for the special work."

At great length he described, with the aid of charts and plans, the work performed by Commodore Stringham with ships against the forts at Hatteras Inlet, commanding the main entrance into Pimlico Sound, where with seven wooden ships carrying 158 guns, 70 on a broadside, the forts were rendered untenable. The work was done by the ships passing and repassing the forts and pouring in a continuous shower of shell and shot, and as the ships did not give the forts the range by anchoring, the firing from the forts was wild and irregular. Admiral Hamilton held that the successful result in this case was owing to the superiority of the shell firing against earthworks, for little damage would have been done to these works by solid shot.

Admiral Farragut's expedition against New Orleans was then spoken of, and described as the boldest and most successful effort ever made to match wooden ships against forts at close range, the forts, too, being assisted by ironclad rams and a fleet almost as numerous as the attacking fleet. The attack on Vicksburg, the action of the Upper Mississippi squadron, and other work by the Northerners against forts and ships were described by the lecturer in detail, and he drew attention to the immense superiority given to the North by her possession and use of shells. The conclusions he drew were: Shell must be the rule against forts and unarmored vessels, solid shot the exception—shell demoralizes where it does not penetrate. In attacking forts under way, very close order must be kept. Farragut passing Vicksburg remarks: "If the ships had kept in close

order, in all probability they would have suffered less, as the fire of the whole fleet would have kept the enemy from his guns a longer space of time, and when at his guns his fire would have been more distracted." If hydrography permit, pass and repass the forts at various distances previously arranged, by which your own time-fuses can be fitted, while the enemy will have difficulty in getting your range; ships not to follow in each other's wake. A powerful ironclad navy with numerous vessels of light draught ought in time to capture forts isolated from the main land and unable to get in fresh troops. Water defenses with an army in rear