

can only be taken by a combined army and navy attack. A good corps of surveyors is essential. In all coast defenses against ships, naval officers should be consulted on the position of the fort.

In the discussion which followed, Captain Colomb, R.N., supported the tactics of ships passing and re-passing the forts they are attacking, and pouring in broadside after broadside. This caused loss of nervous power in the garrison. Captain Burney insisted upon the necessity of commanders of iron-clads maneuvering their ships at full speed in time of peace, so as to become perfectly acquainted with the peculiarities of their ships. Mr. Scott Russell, Admiral Selwyn, Commander Curtis, General Cavanagh, and Captain McIntyre, R.N., also spoke.

#### New Inventions.

A new Tray Lifter for trunks, patented by Mr. A. A. Vola, of Brooklyn, N. Y., consists of a catch which is applied to the trunk lid and is capable of engaging a tray to lift the latter when the lid is raised.

A new Skirt, invented by Mr. Samuel Fellner, of Streator, Ill., has an upper flannel portion combined with lower portions of rubber cloth and interposed cotton wadding. It does not absorb dampness, and when soiled can be easily cleansed with a sponge.

A new Sleeve Button Link, devised by Mr. Charles Hein, of Corona, N. Y., consists in a double hook and locking bar, pivoted to each other at the center of the link in such a way that the ends of the said bar may be sprung into grooves in the said hooks.

An improved Shoe, devised by Mr. William G. Viall, of North Adams, Mass., has its upper made in two pieces, the vamps being cut in one piece with the tongue, and with rearwardly projecting points, and the quarters being cut in one piece, with deep side slits to receive the points of the vamps.

A new Piston Rod Packing, patented by Mr. William Cram, of Raleigh, N. C., consists of a cut ring and a pressure ring so arranged as to form a chamber to receive a lubricant filling which may bear against the trunk.

A new Dental Plugger, devised by Julius M. Stebbins, D.D.S., has a mallet which reciprocates in a tubular chamber from the alternate compression and suction of the air in the rear of the same, so as to cause the said mallet to deliver a series of blows upon the anvil of the tool holder.

An improved Game Apparatus for playing a game analogous to bagatelle, called "bassino," has been invented by Mr. James M. Stewart, of Franklin, Mass. The game is an interesting one, and is likely to become popular.

A new Purse has been devised by Mr. August Vogel, of New York city, which is woven throughout on a loom with a longitudinal center slit or opening, and with transverse closing end bars. It may be divided into sections or pockets.

An improved Faucet Hole Attachment to Barrels has been patented by Mr. E. T. Murphy, of Cambridgeport, Mass. It may be applied permanently to the barrel head and operated by the inserting or taking out of the faucet, that operates a spring acted slide tube of the faucet hole bushing.

An improved Wood Sole Shoe has been patented by Mr. William Gampert, of Keokuk, Iowa, which is strong and durable, and the sole of which may be applied to boots and shoes of any kind.

A new Ticket Case has been patented by Mr. Lewis E. Heaton, of Providence, R. I., which is a convenient receptacle for carrying cards or tickets, and which is so made that but one ticket can be removed at a time.

An improved Saddle Tree Fork has been devised by Messrs. C. M. Lane and M. C. Franklin, of Lockhart, Tex., which is formed of a cast malleable iron fork, a detachable wooden pommel, and wooden side pieces.

A new Spring Bottom for Vehicles has been devised by Mr. E. D. Cramer, of Hackettstown, N. J., which may spring up and down with the body without getting out of place, and which allows the body to be placed lower upon the axles than is usually possible.

Mr. Stephen Sibbald, of Nelsonville, Ohio, has patented a new heater, whereby one or more rooms may be supplied with a continuous current of heated air from one fireplace, at a considerable saving of fuel.

A new Barrel Top Show Case has been patented by Mr. W. H. Grubb, of Hannibal, Mo. It is so constructed as to exhibit merchandise generally sold in barrels, and to obviate the necessity of frequently opening the latter in order to examine the goods.

A new Fire Escape, consisting of an arrangement of wires, a flanged reel and belt for the person being lowered, has been patented by Mr. Francis G. Bryant, of Seattle, Washington Territory. It seems to be an ingenious and efficient device.

A new Chair Back, consisting of thin elastic strips arranged with their ends in grooves of frame, and connected by a corresponding V-shaped convexity and concavity of their adjacent edges, has been invented by Messrs. W. H. S. Greene and A. Sturdevant, of Summit Station, N. Y.

A new Desk, which may be attached to walls and which also may serve as a flower shelf, work table, or side table, has been patented by Messrs. George and John Runton, of Hoboken, N. J.

An improved Child's Carriage, so constructed that its body is rocked when the carriage is moved in either direction, has been patented by Mr. H. Borchardt, of Philadelphia, Pa.

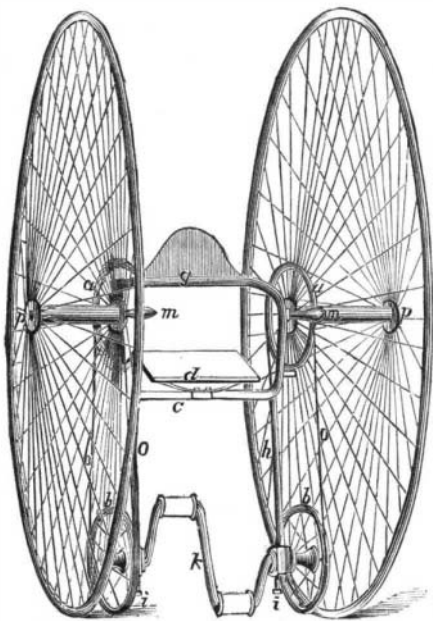
Mr. William Hill, of Sennett, N. Y., has patented a new Clothes Wringer, so constructed that the gear wheels will remain in mesh however much the pressure rollers may be forced apart, that they may be adjusted to give increased leverage, and that the rollers will be pressed together only when the wringers are attached to their supports.

An improved Horse Collar has been patented by Mr. Martin F. Sauer, of Somonauk, Ill., in which the cover of the rim is a single piece of leather. The cover of each belly is also a single piece of leather, having slits formed in the outer edge. The strips and also the belly and rim covers are held together by rivets.

Albert K. Hawkes, of Austin, Texas, has patented an improvement in Eye Glasses, in which the spring that connects the two lenses is made in two parts, which are connected so as to admit of adjustment for the purpose of shortening or lengthening the spring, and thereby correspondingly increasing or diminishing its strength, for the purpose of causing it to press on the sides of the nose of the wearer with greater or less force. The glasses can thus be adapted to different sized noses and worn with greater comfort.

#### THE OTTO BICYCLE.

This is a new style of bicycle lately brought out in London. Its lightness and simplicity of construction are said to

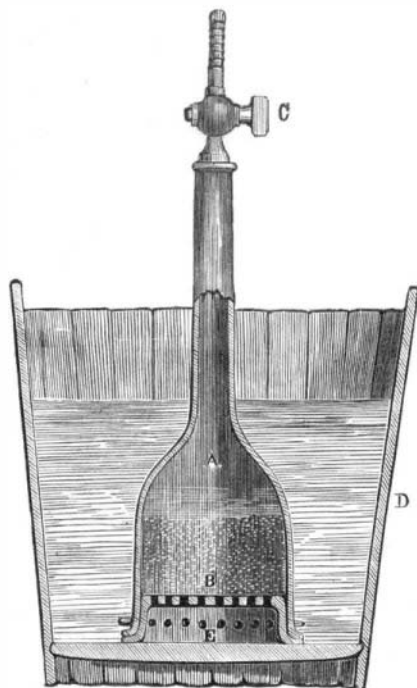


make it one of the safest and easiest going bicycles. The steering is effected by a very simple contrivance, which does not cause any effort to the rider.

C is a bent steel axle, on which rests the rider's seat; on the ends of this axle are two large wheels, which can move independently of each other. To these wheels are attached pulleys, *a a*, which correspond in size with the two pulleys, *b b*, on the treadle crank axle, K. This latter turns in two sliding axle boxes contained in the ends of the steel rods, *h h*, which are attached to the axle, *e*, and the back of the rider's seat, *g*; *o o* are the gut bands that connect the pulleys; *m m* are the handles of the steering gear, which regulate the revolution of the wheels, or stop them entirely by loosening the gut bands and putting on the brakes.

#### A SIMPLE GAS GENERATOR.

The device illustrated herewith is a handy contrivance for facilitating the manufacture of any gas capable of being pro-



duced by liquid reactions and on a small scale. It consists of a bottle shaped tinned copper vessel having at its bottom a grate, B. In the receiver, A, is placed the solid material, which for the production of hydrogen would be iron filings or zinc. The acidulated water is contained in the vessel, D. On opening the cock, C, the water penetrates at E, passes through the grate openings and acts on the metal filings.

Hydrogen is then disengaged and fills the upper tube, escaping at the outlet above. When it is desired to check the production of the gas the cock is closed and the pressure drives the water out of the receptacle, A, leaving the metal filings dry. We are indebted to *La Nature* for our engraving.

#### Labor in Scotland.

The Consul at Dundee sends schedules of wages and prices of food for the last five years. Wages have increased in that time from 5 to 15 per cent; 51 hours make a week's work in the building trades. Bricklayers and plasterers now receive 20 cents an hour; plumbers, masons, and slaters, 16 to 17 cents; painters and carpenters, 15 cents; and common laborers on building work, 12 or 13 cents. Stonecutters are paid 24 cents. The weekly pay ranges from \$6.12 to \$12.24. Engine and machine working artisans receive from \$4 to \$8 weekly, while the various manufacturing tradesmen get from \$3.50 to \$8.50, according to trade and skill. Women get from \$2 to \$3.25 for a week's work of 51 hours. Railway engineers and passenger and freight train hands are paid from \$8.50 to \$10 per week of 60 hours; stokers from \$5.75 to \$6.25, and porters from \$4 to \$4.50. The industry of Dundee is mainly the manufacture of jute. The men are paid from \$1.50 to \$7.50, the women from \$3 to \$4.25 per week of 56 hours. Bread costs 15 cents for a four pound loaf; flour and oatmeal, 4 cents a pound; milk, 8 cents a quart; potatoes, 38 cents for 28 pounds; meat, 16 to 24 cents a pound; eggs, 30 cents a dozen; and other articles in proportion. A suit of serviceable Scotch tweed costs \$17. The rent of a two-roomed house is \$48 yearly; of a three-roomed house, \$72; of a four-roomed house, \$95; and so on. The trade of the district is in a most depressed condition, and the jute mills have ceased to be profitable.

#### The Cattle Drives of 1878.

A correspondent of the *Times*, writing from Dodge City, Kansas, the great shipping point for cattle, reports that the cattle drives from Texas this season will foot up from 225,000 to 250,000 head; some say 300,000. A large share of these will be driven from Dodge City up the Arkansas and Purgatoire, or into the parks, or over the divide into the Platte Valley. Others will go to the ranges on the Republican. During the past three or four years very many Texan cattle have thus been scattered over the plains to multiply. By the introduction of the best blooded stock the quality of the increase on the plains has been greatly improved, so that plains fed bees are now getting the best prices in Eastern markets. The cattle interests of the plains and the Rocky Mountain region are also receiving large accessions from the far West. An Oregon paper reports that 100,000 head of cattle from eastern Oregon and Washington Territory, and from Walla-Walla and the Yakima and Snake River countries, are ready for driving across the continent, some to be held back on the plains of Colorado, Wyoming, and Nebraska for good marketing, others to be driven direct to Omaha. Within a few years a great change has taken place in the cattle trade, and more is promised in the immediate future. The feeding grounds are being transferred from Texas to the great buffalo plains; and the central portion of the continent, with the Pacific States, are becoming the leading producers of beef. An estimate derived from the assessment returns of this year gives Colorado 550,000 head; Wyoming, 225,000; Utah, 350,000; Washington, 200,000; Montana, 300,000; Oregon, 175,000; California, 650,000. Though Texas has probably twice as many cattle as all these together, the indications are that the great West will soon take and keep the lead.

#### Effects of Emancipation.

Revisiting the scenes of his war experience, Col. Higginson finds a marked improvement in the social and physical condition of the blacks. The negroes now sleep in beds where formerly they slept on the floor. The cabins, in old time, had no tables, and families rarely ate together, but now they generally have family meals. Pictures from illustrated papers adorn the walls, and the children's school books are seen on the shelf. Col. Higginson met but one of his black command who complained of poverty, and he earned good wages, but having no wife or children to support, was given to whisky. Most of his old soldiers had a comfortable homestead, with from five to two hundred acres of land. Many were highly prosperous.

#### A New Trouble with French Wines.

M. Gautier has lately brought to the notice of the French Academy of Sciences a disorder affecting the wines of the southern part of France, hitherto undescribed. This trouble, which is known as *vins tournés*, appears after warm and rainy seasons. The wine becomes troubled, and its surface irised; the coloring matter passes from red to violet-blue, and is precipitated, the supernatant liquor being yellowish-brown, and having a baked odor and an acid and slightly bitter taste. M. Gautier states that these changes are brought about by a parasite which appears in a filamentous form in the deposit.

#### American Institute Exhibition.

The forty-seventh exhibition of the American Institute, New York city, promises to be of unusual value. Our inventors and manufacturers have at last learned the value of meeting the purchaser and consumer face to face. For rules, space, etc., address the General Superintendent.