

nation upon constitutional lines, embodying the experience and the lessons of the ages, was the work of the graduates of the colonial colleges. Harvard, Yale, and Princeton, Columbia, and William and Mary were the architects of the Declaration of Independence, of the Constitution of the United States, of the union of the States, and of the incomparable system of executive, legislative, and judicial independence and interdependence which have survived so successfully a century of extraordinary trial and unprecedented development. Samuel Adams, in his commencement thesis at Harvard, struck the keynote of colonial resistance. John Morin Scott brought from Yale to New York the lessons which prepared that rich and prosperous colony for the sacrifices of the Rebellion. Alexander Hamilton, a student at Columbia, though only seventeen years of age, educated the popular mind to the necessity of the struggle; while the pen of Jefferson, of William and Mary, wrote that immortal document which lives and will live forever as the most complete charter of liberty.

"The best proof of the value of a college education in all the pursuits of life is to be found in the eminent success of those who have enjoyed it in the higher walks of the professions, of statesmanship, of business."—The Literary Digest.

#### Power Required for Electric Traction.

In an article in the Sibley Journal of Engineering, Mr. James Lyman gives the results of a number of tests made in different American cities of the power required for electric traction. At Rochester, where the first of Mr. Lyman's records were obtained, there are about 20 miles of track which was in good condition at the time of the test. The number of cars on the road was 40, each weighing about 8 tons and provided with a 15 horse power geared motor. In general the road was level, but in the heart of the town there were some gradients of from 3 to 4.7 per cent. Moving on the level the necessary tractive power averaged 38 lb. per ton of car, and for the whole run over the four principal routes at 6.5 miles per hour, the average horse power was 1.4 per car, and the maximum 6 horse power, this latter being used only momentarily. At Buffalo the same average power was required, but the

maximum was 6.6 horse power. In a large Western city a car with the axles coupled direct to the motor, without the intervention of gearing, took 0.92 horse power per ton on the average with a maximum of 4.7 horse power. In wet weather the tractive power required is reduced, the rain acting as a lubricant. Wetting of the rails round curves is particularly effective, the requisite tractive power being thereby reduced by one-third. Comparative experiments made at Ithaca, N. Y., showed that on gradients the tractive force required exceeds that on the level by more than the theoretical amount.

#### The Dismal Swamp and its Occupants.

"I have just returned from a visit to the Dismal Swamp," said Dr. A. K. Fisher, ornithologist of the Department of Agriculture, in Washington, the other day. "It is a strange region, full of oddities that are not to be found elsewhere. The purpose of my expedition was to investigate the fauna of the locality, and of rare mammals and birds I secured quite a number. Snakes are abundant and are alleged by the natives to be venomous, but all that I saw were harmless. When I picked up a good-sized one from a log and held him by the neck, the negro who was paddling for me shuddered so he nearly upset the boat.

"I found about fifty species of birds breeding in the swamp. One of them was Swainson's warbler, which is very rare. I trapped several species of small mice—rice mice, field mice, golden mice and lemming mice. The lemming mouse is hard to catch, because it will not take any sort of bait; the only way to capture it is to set a trap in its run way. I set my traps in dry places out of water. Among other things I got two rare shrews.

"There are plenty of cattle in the swamp—small, dark and very wild. They are the progeny of animals that have strayed from domesticated herds. Hunters stalk and shoot them like deer. Bears are numerous. In the autumn they feed greedily on the fruit of the sour gum. Wildcats, opossums and raccoons are not scarce, while squirrels are remarkably abundant. The squirrels have discovered an easy way to get a living by going along the shores of Lake Drummond and picking up the nuts and berries which have fallen into

the water and drifted in windrows. They trot along the logs and fish them out with their paws. Deer are common but hard to get. In the fall hunters run them into the lake and catch them with dogs.

"There is fine fishing in Lake Drummond, which contains plenty of perch, black bass, two kinds of pickerel, three species of sunfish and other panfish. There is no dry ground in the swamp, and one sinks at every step to his knees in mud. The cane which forms brakes all through the South is abundant. Together with a varied undergrowth, it is tangled with vines that run up into the trees, so that half a mile an hour is a good rate of progress. One must carry a knife to cut the vines, walking being further impeded by the cat brier, whose thorns catch in the clothing and hold on like hooks.

"The boats used in the Dismal Swamp are all dugouts, made from cypress logs, twelve feet long and very narrow. To shape such a craft properly is a nice piece of work. The novice who steps into one of these boats is apt to go out on the other side, but the native stands up and paddles with security. The water is darker than amber and excellent to drink; it is said to be a sure cure for malaria. There are no malarial diseases in the swamp. The swamp is full of magnolias, from the size of bushes to trees sixty feet high.

"When I was there they were full of flowers. The cypress trees are cut for shingles. The best trees for the purpose are those which fell from twenty-five to fifty years ago, and are now covered with moss. The negroes wade in and cut off the moss and rotten bark. Then they cut up the log into shingles on the spot. The next best tree is one that is newly fallen, and the third quality is the tree that has to be felled."—Philadelphia Telegraph.

ACCORDING to Dr. Krüger, of Charlottenburg, Germany, a mixture of equal volumes of acetylene and carbonic acid gas can be used with all ordinary gas burners and gives an excellent light, and which is practically entirely without the explosive qualities possessed by the pure acetylene gas. Compressed acetylene and carbonic acid gas can be obtained commercially in Germany, so that gas illumination can be obtained independent of gas companies' pipes.

#### RECENTLY PATENTED INVENTIONS.

##### Railway Appliances.

**CAR FENDER.**—John F. Girtler, Brooklyn, N. Y. This fender is conveniently attachable to any car, and adapted to be folded up when not in use. The fender frame is detachably connected by hooks with the dashboard, and on its lower end is pivoted a forwardly and downwardly extending platform, held in position by chains, and beneath which are track rollers, there being on the front end of the platform a tripping plate connected by springs with a guard rail, which is swung into position to hold a person in the path of the car safely on the fender, when struck by the tripping plate.

**BUFFER AND DRAUGHT DEVICE FOR CARS.**—George E. Shuey, Lawley, Fla. This improvement is designed to relieve car frames from pulling shocks or strains, or the impact of one coupling on another. A yoke is transversely secured to each coupling, at each side of which, on the car frame, are guide rods carrying springs pressed on by a follower plate, draught rods secured to the yokes passing loosely through the follower plates.

##### Electrical.

**THERMOMETRIC CIRCUIT CLOSER.**—Richard Pearson, London, England. According to this improvement, a thermometer mounted on a horizontal axis is so balanced as to be caused to oscillate under the displacement of the center of gravity by the expansion and contraction of the thermometric fluid, thus automatically completing or breaking an electric circuit for any purpose. A novel form of thermometer is employed, in which the mercury serves only to render visible the expansion and contraction of a lighter fluid, and also as a means of producing the oscillation of the instrument, the balance of which may be readily adjusted so that it will oscillate at any given temperature.

##### Mechanical.

**NUMBERING MACHINE.**—Thomas F. Geary and William E. Bracewell, Brooklyn, N. Y. This improvement is more especially designed for use in rotary web-perfecting printing presses and other machines, to be inserted in the type or printing plate cylinder, to effect numbering with each impression. The numbering wheels, meshing with gear wheels, are mounted in a frame to be set in the plate, the shafts of the wheels passing through a slot in a spring-pressed slide carrying a pawl engaging one of the gear wheels, while a head is engaged by the impression cylinder to operate the slide.

**ENGRAVING MACHINE.**—Jere G. Kingsbury, Bridgeport, Conn. This is a machine for cutting numbers in intaglio, or below the surface, upon a counting wheel, the wheel doing all the work of cutting and finishing with the service of but a single attendant. It has two shafts, one supporting a master wheel and the other a blank wheel, there being means for imparting rotary movement to one shaft and a compensating gearing between the two shafts, while a delineating arm having a tracing point engages the master wheel and a cutting tool engages the blank wheel.

##### Agricultural.

**HAY LOADER.**—Ole and William Swenson, Cresco, Iowa. In this implement an elevator is sus-

pended from the axles of drive wheels, and provided with reciprocating feed arms operated from one of the drive wheels, the mounting of the elevator enabling a person standing upon the load to readily elevate the upper end of the elevator. At the rear of the elevator is a rake, and shields facilitate the grasping of the hay by hook teeth at the bottom of the elevator arms, two of these teeth on each arm delivering the hay from the rake to the elevator.

##### Miscellaneous.

**BICYCLE WHEEL.**—Gustave Le Blanc and Leander Johnson, Mead, Neb. The tire of this wheel is of solid rubber, oval in cross section, fitting in a rim of similar outer surface and having side flanges, and the rim is connected to the spokes by means of bow springs, the spokes crossing each other, and each spoke being connected with the spring by a nipple or nut, by which the springs may be placed under more or less tension. By this means a maximum degree of resiliency is given to the wheel without employing a pneumatic tire, and the wheel is made very strong.

**BLASTING POWDER.**—Benjamin C. Pettingell, Victoria, Canada. This is designed to be a cheap powder of great strength, which will emit no flame when exploded and will make less than half the smoke of the black powder in common use. It is manufactured by first immersing powdered carbon alone in a solution of niter, drying, and afterward adding and mechanically mixing therewith sulphur and wood pulp.

**EVAPORATING LIQUIDS.**—Leon F. Hauptman, New Orleans, La. An apparatus for evaporating water and saccharine solutions or other liquids has been devised by this inventor, in which superheated air is caused to absorb the moisture contained in the liquid to be concentrated by causing the hot air, driven by a blower, to come in direct contact with a flowing liquid, the liquid flowing in an opposite direction to the movement of the air, and a current being created opposite to the current of the liquid.

**FILLING CHOCOLATE DIPPERS.**—Cyprien Gousset, New York City. This inventor has devised an apparatus to facilitate the manufacture of chocolate cream drops, consisting of a table provided with projections, each adapted to support a cream drop in position to be passed into a pocket in the chocolate dipper, a perforated guide board causing the cream drops to take position upon the projections.

**AFFIXING STAMPS.**—William L. Dinsmoor, Portland, Oregon. This inventor has devised a machine, to be operated by one hand, for applying stamps to envelopes and other packages to be mailed, the machine holding a large number of stamps, which are fed out one by one, moistened and applied. The machine has a spring-controlled plunger, beneath which is a sliding table, a stamp-feeding device being operated simultaneously with the upward movement of the plunger, while a moistening device independent of the plunger is operated from the table. It is said that the machine will stamp 45 letters per minute, and it may also be used for moistening envelopes.

**MUSIC LEAF TURNER.**—Daniel T. Fox, Mount Pleasant, Pa. The body of this device supports a series of pivoted swinging sheet-carrying arms, finger-operated throw devices being arranged when pressed upon to throw the carrying arms. The throw devices include lever members to impart a speed movement to the

arms, giving them increased speed as they near the end of their movement. The turning action is effected in a gentle but positive manner, without danger of tearing the sheets.

**CLOTHES DRIER.**—William M. Rowley, Cuba, N. Y. A rack of very simple and inexpensive construction has been devised by this inventor, capable of being attached to any convenient support, and which when in use will be firmly braced, the arms adapted to support the clothes being held adjustably in a horizontal position. When the rack is not in use it may be folded downward compactly parallel with its support and be practically out of the way.

**BED CLOTHES HOLDER.**—Russell T. Joy, Tacoma, Washington. For holding bed clothes on a bed, this inventor has devised a holder, the gripping jaws of which will not injure the most delicate quilt or other bed covering, a locking device setting the jaws at various distances apart or substantially close together to effectually hold the thickest or the thinnest bed clothes.

**LAWN SPRINKLER.**—Russell T. Joy, Tacoma, Washington. This is a sprinkler of inexpensive construction, comprising virtually but two parts, and arranged for the easy regulation of the spray. The casing has an arched bottom, which will not injure the surface of the sod, and has an inlet opening at one side to which the hose is coupled, while the separating or sprinkling cone is screwed adjustably to place, to form a fine spray or to deliver the water more in sheet form.

**CULINARY UTENSIL.**—Edward O. Rabon, Philadelphia, Pa. A utensil for pouring batter on a griddle in making batter cakes has been provided by this inventor. It comprises a vessel with an outlet at its lower part controlled by a valve actuated by a lever adjacent to the handle, whereby the device is operated by a minimum movement of the hand and is made at once simple and convenient.

**NAPKIN HOLDER.**—Alexander A. Vernon, Owen Sound, Canada. This holder permits the wearer to readily apply it on a collar or neckband, and consists principally of a back plate having on its upper end rearwardly extending hooks, the plate having at its lower end a doubled up clamping band to securely hold the napkin in position.

**DESIGN FOR FAN RACK.**—Alexander H. Davison, Athens, Ga. This device comprises a vertical column or post with circular base, there being on the post star-like figures with serrated or toothed edges.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

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#### SCIENTIFIC AMERICAN BUILDING EDITION.

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